In 2 P… — Part One No. 2

CHEMICAL INDUSTRIES

The Chemical Business Magazine

The Care and Feeding of BOILERS

Trouble-maker in industrial power plants has been silica in boiler feed-water which can form chisel-hard scale on boiler tubes, superheater tubes and turbine blades. For years water treatment engineers have sought the one best solution to lick the silica problem.

That is the job now being done by *Remosil*—a special magnesium oxide developed by Westvaco chemists in collaboration with the laboratories of W.H. and L. D. Betz of Philadelphia. By adsorption *Remosil* removes silica from boiler feed-water in the form of a voluminous, flocculent, suspended mass prior to entrance to the boiler. Result: Higher efficiency for power plants everywhere.

Remosil is but one of many research developments that has expanded our business beyond the "common" chemicals with which we have usually been identified . . . one of the many Warner Chemicals that are playing an important part in both industrial and defense production.

WARNER CHEMICAL COMPANY

Division of WESTVACO CHLORINE PRODUCTS CORPORATION

CHRYSLER BUILDING, NEW YORK, N. Y.

CHICAGO, ILL. · GREENVILLE, S. C. · NEWARK, CAL.

The Business Magazine for Makers & Users of Chemicals — Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

Contents

Volume 50 Number 2

FEBRUARY, 1942

★

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London: Quadrant House, 55-58, Pall Mall, London, S. W. I., Whitehall 6642

The Reader Writes—

"New Chemicals For Industry" Popular

We should like to have a reprint of the section "New Chemicals for Industry" as it appeared on pages 653-677 of the November, 1941 CHEMICAL INDUSTRIES.

THELMA HOFFMAN,
Librarian,
Shell Development Company,
San Francisco, Calif.

I should like to receive two copies of a reprint of the section "New Chemicals for Industry" pages 653 to 676, November, 1941 issue of CHEMICAL INDUSTRIES. This section could well be used as a reference in our laboratories if they are available for distribution.

H. C. DUDLEY,
Toxicologist,
Federal Security Agency,
U. S. Public Health Service,
Washington, D. C.

We would like to obtain six reprints of the article "New Chemicals for Industry" which appeared in the November 1941 issue of CHEMICAL INDUSTRIES, page 653 to 676.

DORMAN MCBURNEY,
Chemical Superintendent,
Du Pont Fabrikoid Division,
Newburgh, N. Y.

Please advise whether you supply in separate form a set of copies of pages 653 through 676 of the section entitled "New Chemicals for Industry" which appears in Part 1 of the November issue of CHEMICAL INDUSTRIES, and if you do, how may copies be obtained.

A. A. ORLINGER,
Patent Attorney,
Sharp & Dohme,
Philadelphia, Pa.

Editorial Note: There is available a very limited number of the supplements. While the supply lasts we will be delighted to send these to interested persons. The request must be accompanied with the sender's business address and company connection.

Let Us Carry It For You

Cut down on the advertising to keep CHEMICAL INDUSTRIES lighter in weight so we can carry it while traveling.

THOMAS G. HEISER,
Stein Davies Co., Inc.,
Long Island City, N. Y.

Likes "Between The Lines"

"Between the Lines," is the most interesting and instructive feature of the magazine. Have more articles like that.

ROY L. HILL, JR.,
Drexel Hill, Pa.

Women in the Chemical Plants

I think you did a real service in pointing out the experiences the British chemical manufacturers have had in the employment of women in certain types of work in plants. There will be considerable prejudice to be overcome but that will just have to be met frankly with the statement that no sacrifice is too great to make to win this war. And—let us not wait much longer—or it will be too late!

A. A. DESPLAINS,
Chicago, Ill.

Priorities

Allocations

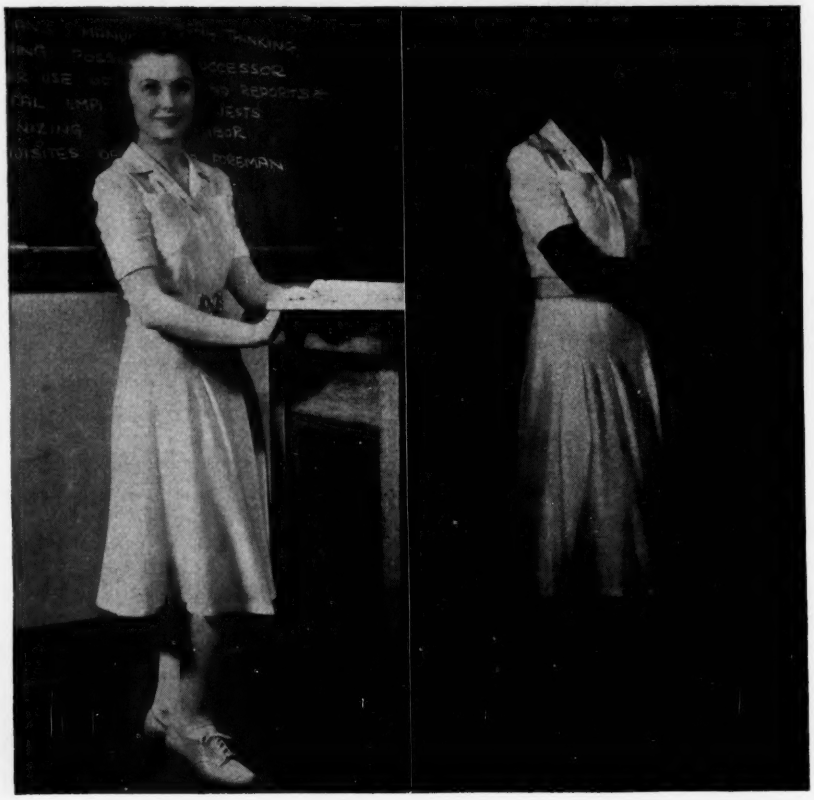
Price Controls

See the Statistical and Technical Data Section (Part 2 of this issue) for digest of Government Regulations of Materials and Prices.

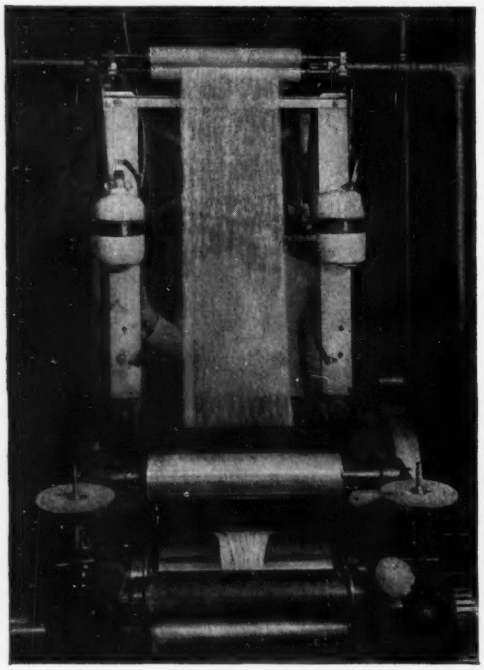
CALENDAR OF EVENTS

Feb. 13, American Institute of Chemists, New York Section, The Chemists' Club, New York, N. Y.
Feb. 15-19, National Electrical Manufacturers Ass'n, Mid-Winter meeting, Chicago, Ill.
Feb. 16, Utah Paint, Varnish & Lacquer Ass'n, Monthly Meeting, Ambassador Hotel, Salt Lake City.
Feb. 16-19, Technical Assoc. Pulp & Paper Industry, Annual Meeting, Commodore Hotel, New York, N. Y.
Feb. 16-20, American Paper and Pulp Association, Annual Convention, The Waldorf-Astoria Hotel, New York, N. Y.
Feb. 19, New England Paint & Varnish Club, Hotel Vendome, Boston, Mass.
Feb. 23, Assn. of Consulting Chemists and Chemical Engineers, Inc., The Chemists' Club, New York City.
Feb. 24, Pennsylvania Chapter, The American Institute of Chemists, Houston Hall, Philadelphia, Pa.
Feb. 28, Annual American Chemical Society Dinner, Engineers' Club, New York City.
March 5, Indianapolis Paint, Varnish & Lacquer Ass'n, Columbia Club, Indianapolis, Ind.
March 12, Chicago Paint, Varnish & Lacquer Assn.
March 12, Drug, Chemical and Alied Trades Section, New York Board of Trade, Inc., 17th Annual Drug, Chemical & Allied Trades Banquet, Hotel Waldorf-Astoria, New York, N. Y.
March 14, Chicago Paint, Varnish & Lacquer Assn.
March 19, New England Paint & Varnish Production Club, Hotel Vendome, Boston, Mass.
March 20, Akron Rubber Group, Akron City Club, Akron, O.
March 23, American Institute of Laundering, Annual Board Meeting, Joliet, Ill.
March 30, Assn. of Consulting Chemists and Chemical Engineers, Inc., The Chemists' Club, New York City.
Apr. 2, Indianapolis Paint, Varnish & Lacquer Ass'n, Columbia Club, Indianapolis, Ind.
Apr. 9-10, American Water Works Association, Indiana Section, Purdue Memorial Building, Lafayette, Ind.
Apr. 14-17, American Management Association, Packaging Conference & Exposition, Hotel Astor, N. Y.
Apr. 15-17, American Water Works Association, Canadian Section, Niagara Falls, Ontario, Canada.
Apr. 15-17, National Wholesale Druggists' Ass'n, Spring Meeting, Palmer House, Chicago, Ill.
Apr. 15-18, The Electrochemical Society, Inc., Electric Furnace & Corrosion Convention, Nashville, Tenn.
Apr. 16, New England Paint & Varnish Production Club, Hotel Vendome, Boston, Mass.
Apr. 16-17, National Petroleum Association, Cleveland, Ohio.
Apr. 17, American Institute of Chemists, New York Chapter, Chemists' Club, New York, N. Y.
Wk. of Apr. 19, The American Ceramic Society, 44th Annual Meeting, Cincinnati, O.
Apr. 20-24, American Chemical Society Semi-Annual Meeting, Memphis, Tenn.
Apr. 20-22, American Water Works Association, Southeastern Section, Savannah, Ga.
Apr. 27, Assn. of Consulting Chemists and Chemical Engineers, Inc., The Chemists' Club, New York City.
May ? 1942, American Spice Trade Association, Inc. Annual Meeting.
May 4-7, American Drug Manufacturers Association, Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va.
May 7, Indianapolis Paint, Varnish & Lacquer Ass'n, Columbia Club, Indianapolis, Ind.
May 7-9, American Water Works, Pacific Northwest Section at Marcus Whitman Hotel, Walla Walla, Wash.
May 11-13, American Institute of Chemical Engineers 34th Semi-Annual Meeting, Boston, Mass.
May 11-15, National Electrical Manufacturers Ass'n Spring Meeting, Hot Springs, Va.
May 12-13, The Associated Cooperage Industries of America, Inc. Annual Convention, Jefferson Hotel, St. Louis, Mo.
May 15-16, American Water Works Assoc., Ohio Section, Toledo, O.
May 18-20, Flavoring Extract Manufacturers' Assoc. 33rd Annual Convention, Hotel Pennsylvania, New York, N. Y.
May 18-22, American Association of Cereal Chemists, Annual Convention, Edgewater Beach Hotel, Chicago, Ill.
May 21, New England Paint & Varnish Production Club, Hotel Vendome, Boston, Mass.
May 22, American Institute of Chemists, New York Chapter, Annual Meeting, Chemists' Club, New York. N. Y.
May 25, Assn. of Consulting Chemists and Chemical Engineers, The Chemists' Club, New York, N. Y.
May 25-28, National Association of Purchasing Agents National Convention and Inform-A-Show, Waldorf-Astoria Hotel, N. Y. C.
May 25-27, The American Leather Chemists Ass'n, Annual Meeting, The Sagamore Hotel, Bolton Landing, Lake George, N. Y.
May 26-28, National Lime Association, Annual Convention, The Homestead, Hot Springs, Va.
May 28-29, Tanners' Council of America, Spring Meeting, White Sulphur Springs, W. Va.
June 1-3, Scientific Apparatus Makers Ass'n.
June 8-10, The National Fertilizer Association, 18th Annual Convention, Greenbrier Hotel, White Sulphur Springs, W. Va.
June 8-11, American Electroplaters' Society, Annual Convention, Pantlind Hotel, Grand Rapids, Mich.
June 18, New England Paint & Varnish Production Club, Hotel Vendome, Boston, Mass.
June 21-25, American Water Works Association, Annual Convention, Stevens Hotel, Chicago, Ill.
June 22-26, A.S.T.M. 45th Annual Meeting, Chalfonte Haddon Hall, Atlantic City.

Life On The



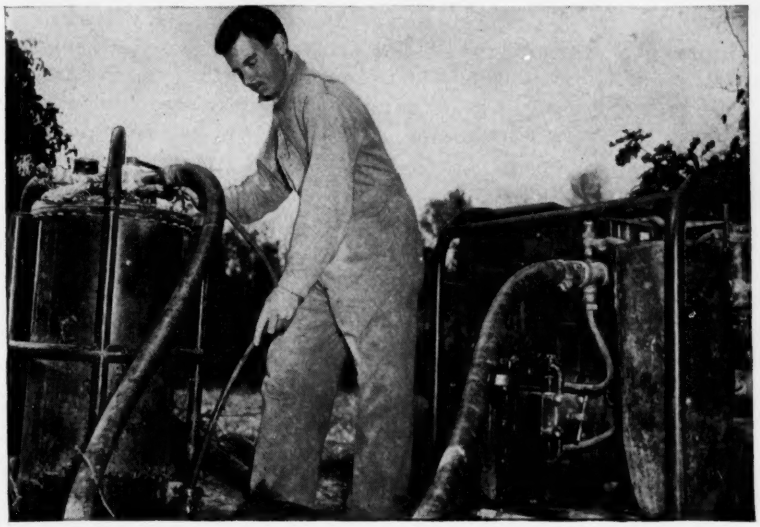
(*Right*) **"BLACKOUT" CLOTHING**—clothing dyed with a fluorescent dye—looks quite normal and very comely under ordinary light, as shown in the left hand photo. But when the blackout comes and only invisible ultra-violet light is permitted, it glows brightly as at right—enough to be seen quite clearly at short distances. Shoes and stockings, as well as dresses and suits, also emit a subdued glow under ultra-violet light when treated with this dye. The demonstration shown here was made recently by Cyanamid's Calco Chemical Division, a pioneer in the development of fluorescent dyes. Many types of fluorescent dyes are available that produce colors varying from violet through blues, greens, yellows, oranges, and browns to bright reds. Not only do these dyes facilitate traffic control in factories and offices during a blackout, but they prevent accidents on the street. When ultra-violet lights are used in the headlights of vehicles, they make pedestrians wearing fluorescent-dyed clothing visible to motorists. Fluorescent dyes have already found successful application for making theatre carpets luminous, producing weird effects in theatrical productions, and in England they are used for such objects as the markers that point the direction to air raid shelters.

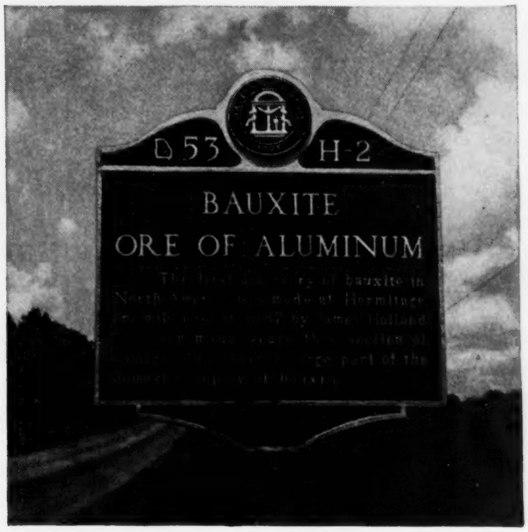


(*Above*) **"CLOTH WITHOUT WEAVING"** is the result of a new chemical process developed by Fiber Products Laboratory which involves laying fibers parallel and "cementing" them together with a chemical binder. Although cotton is widely used in making fabrics by this process, it can be applied to other fibers that cannot be woven. This process is now being used to make bags, floorbacking, and other materials formerly made of burlap. Cyanamid's DECERESOL* Wetting Agents are used to wet out the fibers preparatory to coating.

(*Below*) **ONE ANSWER TO THE TIRE SHORTAGE** is seen in commercial development of Guayule rubber, first reported in *Life On The Chemical Newsfront* in November, 1941. Pressed into 100-pound slabs, like that shown, it looks much the same as the softer grades of Hevea, or Far Eastern rubber, and is no different chemically. Guayule rubber can be used for the same purposes as tree rubber and can be used in existing rubber machinery. According to the Tariff Commission, tires made from Guayule give 90 per cent of the mileage of tires made from Hevea.

Chemical Newsfront



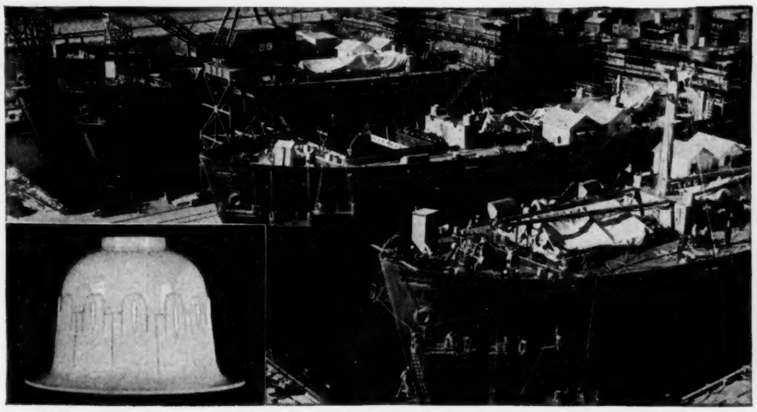


(*Above*) **PURE DRINKING WATER** is assured American soldiers by portable purification plants that can be easily transported wherever the Army goes. Here a test sample of water is being drawn from a filter plant. For many years American Cyanamid has been supplying chemicals to municipal water purification plants throughout the country to insure an abundance of fresh, pure water.

(*Above*) **26 YEARS AGO** a company, now a part of American Cyanamid, began Bauxite mining operations in Georgia. It was here in the year 1887 that James Holland is said to have made the first discovery of this valuable ore in North America.

(*Below*) **LIGHTING THE "LIBERTY FLEET" VESSELS** of Uncle Sam's rapidly growing Merchant Marine are Safety Reflectors made of BEETLE*, a Cyanamid plastic. Lightweight, shatterproof BEETLE lighting units are also providing efficient illumination in defense construction projects of every type. BEETLE Safety Reflectors have received the endorsement of leading lighting authorities, architects, and Government construction planning boards.

(*Below*) **CHEMICALLY-TREATED FABRICS** are used by the Army for numerous purposes. Shown here, a water-repellent fabric gets a laundering test by the Q M Corps. For the textile industry, American Cyanamid supplies chemicals and specialties used for water-repellent finishes and shrinkage control.



American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA · NEW YORK, N. Y.

*Reg. U. S. Pat. Off.

Washington

By

T. N. SANDIFER

FOR better or worse the jolting and bumping war production machine has undergone another jacking-up, and in place of OPM, with its twin-managers Knudsen and Hillman, there has emerged the War Production Board, headed by Donald M. Nelson, and powered, through an order Nelson himself was permitted to draft for White House approval, with extraordinary authority.

Formerly the energetic and self-starting director of the Priorities Division, Nelson's advent in his more powerful role is generally viewed with optimism in Washington, but it must be added that at this early stage, the most evident result has been a clearing of the atmosphere.

Close inquiry at this writing indicates that the Chemical Branch so far remains as an important function of the Materials Division, which in turn is headed by William L. Batt. The materials group assumes added importance in general from a new concept of priorities processes; these will originate in the Materials Division, or its several pertinent branches, and be routed through a new division created in the War Production Board, the Division of Industry Operations. J. S. Knowlson, formerly deputy under Nelson, heads this group, and the allocations of materials will be made on a priority basis here.

T. N. Sandifer

No internal changes have occurred to date in the Chemical Branch, and none were on the horizon, but nothing remains static long here. However, no reason appears for any internal changes, and none were anticipated. Some additions were made, including that of David L. McKee, of Memphis, Tenn., as consultant in the cellulose unit of the Chemicals Branch, as an authority on cotton linters.

Meanwhile Congress has passed a Price Control Bill which has aroused little enthusiasm, and at this stage the country is facing in addition, a series of drastic curtailments in its use of products of every-day nature, beginning with sugar, and now threatening to extend into a wide field of retail activity.

The sugar restriction grows directly out of the demand for munitions alcohol, and the Pacific war, despite efforts to ease pressure on this product in favor of other materials. In this connection a molasses restriction order curtailed use of high-test molasses, and diversion of certain products to distilled beverage production. There is still pending at the Chemical Branch an offer by representatives of the distilled beverage spirits industry to convert its entire plant output, so far as adaptable, to alcohol production. Meanwhile the effect of the various orders for alcohol will be to halt all production of distilled beverage spirits except those in plants not adapted to production of 190 proof ethyl alcohol from grain, or focus production in limited amounts in certain plants for general use.

A further reaction from the war in the Pacific has been a drastic curtailment in the tin supply to be allotted for tin containers, momentarily expected to be embodied in an order at this writing, and doubtless to be public by the time this appears.

The mortality predicted among small businesses for this time of the year, by various OPM officials before Congres, and elsewhere, is beginning to be manifest under all these various shut-downs, in auto trades, retail outlets of various kinds, and others.

Taxes and the War

There remains the question as to taxes for the war effort. Congress will begin actual hearings about March 1 to 15. In the interim, and for the first time, experts of the Internal Revenue division of the Treasury are working closely with their opposite numbers under the House Ways and Means Committee.

With increasing pressure on the production of war chemicals, plants engaged in this phase of activity will receive high priority ratings A-1-a on deliveries of materials to repair actual breakdowns, A-1-c on materials required to avert immediate threatened stoppages and A-3 to procurement of materials for general repair, maintenance and operation, under Preference Rating Order P-89.

Before applying such ratings, the order requires the manufacturer to file with the Chemical Branch, War Production Board, a statement of certain facts, and a serial number will then be assigned. Such information will cover amounts of such materials used for the first half of 1941, inventories of material for this purpose on hand as of December 31, 1940, and of June 30, 1941, together with a statement of acceptance of the terms of the order.

The first two ratings may not be used to replace withdrawals from inventory, and the A-3 rating may be used only when the materials covered will not raise inventory levels above a stipulated minimum. P-89 is now effective, from January 23.

Price Actions

Price actions of note include: a conference late in January of representative manufacturers and distributors of aspirin, caffeine, citric acid and Vitamin C, to consider ceiling prices on these and other drugs demanded in quantities by the American Army and Navy, and by Lend-Lease transactions.

Announcement by the Department of Agriculture of a program to sell Commodity Credit Corporation wheat at 91 cents per bushel delivered, to processors of ethyl alcohol, acetone, and butyl alcohol, for use in place of corn. The price is stated to be comparable to prices previously quoted on corn for the same purpose, on a pound basis. A lower sales price will be made to high-conversion cost producers, and adjustments will be made for any change in the present ethyl alcohol price of 50 cents per gallon established by OPA:

Maximum price of .0425 cents per pound for normal grade lithopone, effective Feb. 2, in Schedule No. 80;

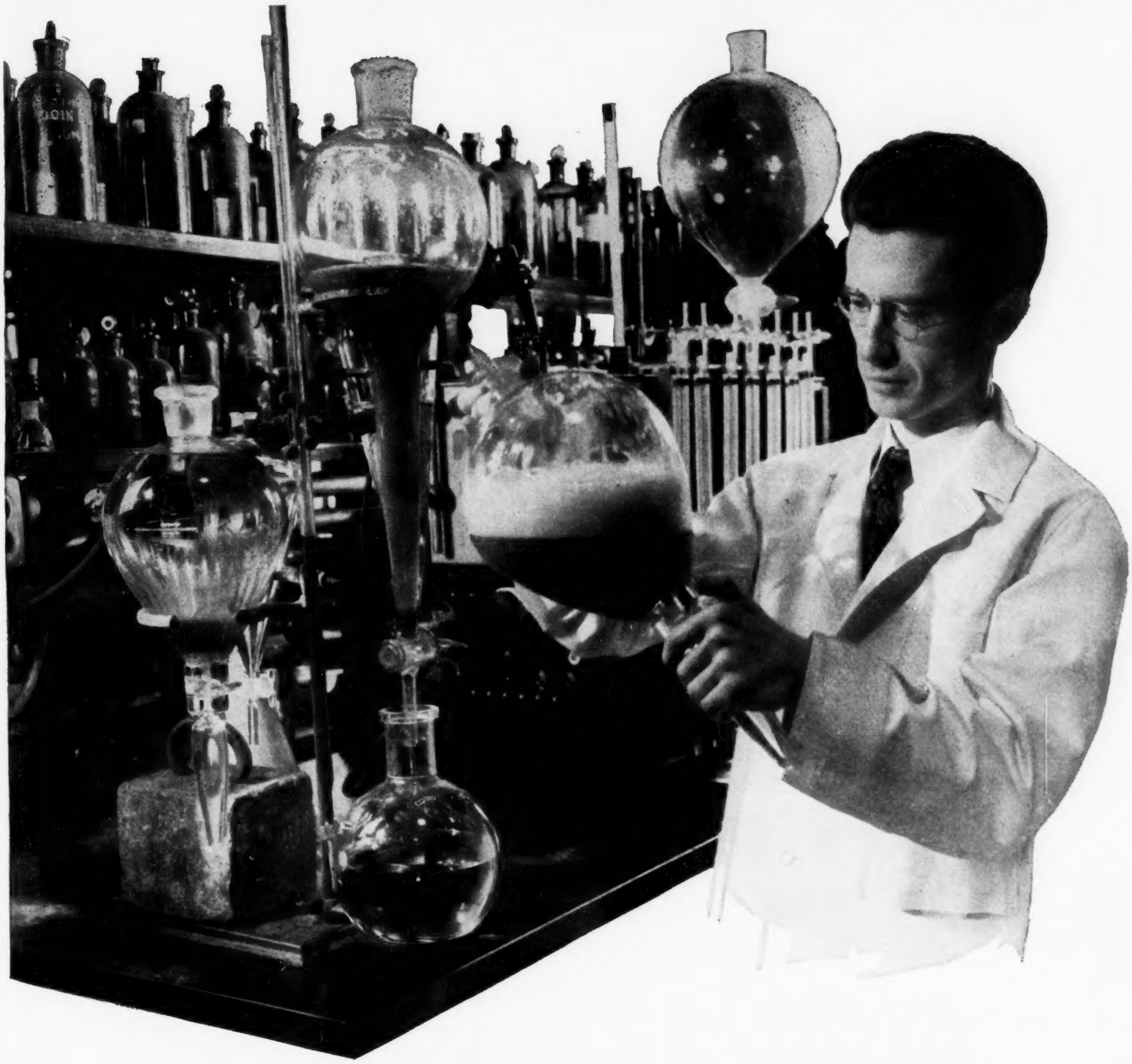
Maximum prices for tetrachloride fixed at current levels by Price Schedule 79, effective February 2; 73 cents per gallon, carload lots in 50-55 gallon drums in Zone 1; 80 cents in Zone 2; 94 cents in Zone 3; and 83 cents in Zone 4, with various differentials;

Maximum prices for oxalic acid set in Price Schedule 78, at 11¼ cents per pound in 100-pound lots or more, F.O.B.;

Advanced prices amounting to $1 per ton on borax and $2 a ton on Boric acid, justified by increased production costs, authorized by OPA, with provision deferring such action for 30 days, or until March 24;

Other actions of either OPM, or its transformation MPB include a complete allocations system, effective February 1, for sodium nitrate. Used as a fertilizer, in meat curing and preserving, in manu-

(Continued on page 146)



WASHINGTON

(*Continued from page 144*)

facturing industrial explosives, nitric acid, potassium nitrate and glass, approximately 70 per cent of the supply comes from South America, and lack of shipping, since rendered even more acute by submarine attacks on American and other coast-wise shipping on this side of the two oceans, was held to justify a move toward allocating available supplies. Allocations will be made under General Preference Order M-62, which became effective January 15 for an indefinite period.

Also, under Conservation Order M-1-E, the entire national supply of aluminum is sequestrated for war contracts and certain other specified uses including containers for intravenous solutions and blood; this order became effective January 27, and remains operative indefinitely.

Mercury and Alcohol

Conservation Order M-78, effective from January 26, provides for conservation of mercury, and further stipulates that from January 15 mercury use in manufacturing a list of articles including among others, marine anti-fouling paint, chemicals for treatment of green lumber, except Sitka spruce, turf fungicides, wood preservation, vermilion, and thermometers except scientific or industrial, must be curtailed to not over 50 per cent of requirements during a base period optionally the corresponding quarter of 1940 or the first calendar quarter of 1941. Restrictions do not apply on goods under defense production, or to meet underwriters' specifications.

The War Productions Board has issued several amendments to the Ethyl Alcohol Order M-30, the principal one of which changes the definition to indicate that alcohol for industrial use only is comprehended, including proprietary solvent in the term; the amendment changes the restriction provisions from monthly periods to calendar quarterly periods henceforth, and rescinds restrictions on producer's deliveries previously contained in the order; also it provides that certain orders including those with preference ratings of A-1-j or higher may be filled without reference to quantity limitations. Among exemptions provided in the amendment, are monthly deliveries of 54 gallons or less of ethyl or isopropyl alcohol to any one person during one month.

An important development in allocations under WPB was the assignment of all sulfite pulp allocated for special purposes during January to one producer, Rayonier, Inc., for distribution among that concern's customers.

(*Continued on page 240*)

THIS is a war of production and this is the kind of fellow who's going to do a lot of the winning of it. • Manned by an army of experienced workers, Michigan Alkali is now working at maximum capacity, twenty-four hours a day, seven days a week. Our production of chemical products is continuous. • Many of our personnel well remember World War 1, and are abiding by its lessons. Today these lessons are helping them turn out quality basic chemical materials for war needs at amazing speed.

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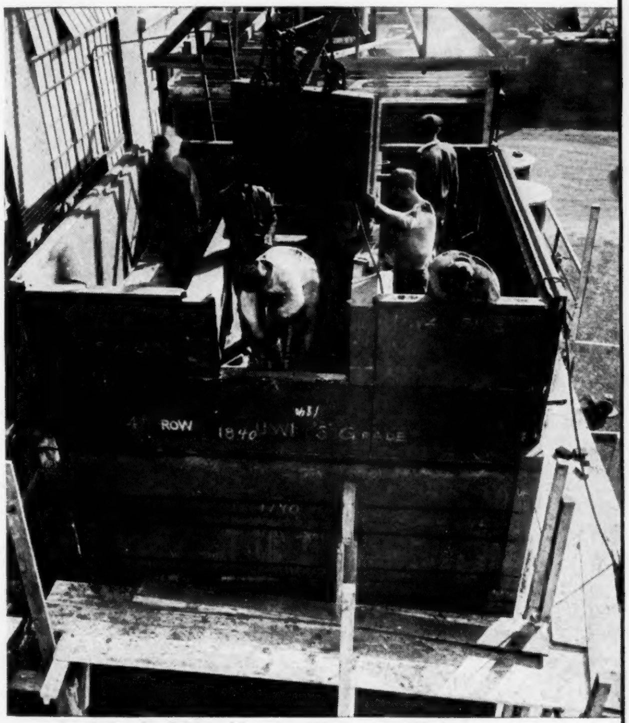
*The word "National" is a trade-mark of National Carbon Co., Inc. The word "Karbate" is a trade-mark for a line of carbon or graphite base materials impervious to seepage of fluids under pressure.



This ALL-CARBON ELECTROSTATIC PRECIPITATOR is an example of the use of carbon structural elements for *permanent* construction in the presence of conditions destructive to other materials.

The large structural shapes available in Carbon, Graphite and "Karbate" materials greatly reduce erection cost.

Beams, blocks, slabs and solid cylinders of these structural materials are regularly available in any size up to the limits shown below. These can be pre-fabricated for easy and rapid installation.

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Rectangular form . . . . 24 in. x 30 in. x 180 in.
Cylindrical form . . . . . 40 in. diameter x 110 in. long

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Rectangular form . . . . 16 in. x 16 in. x 72 in.
Cylindrical form . . . . . 20 in. diameter x 72 in. long
24 in. diameter x 48 in. long

Still larger sizes can be produced for special requirements.

• • •

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BRICK — All standard shapes; circle brick made to order.

PIPE and TUBES — From ½ in. I.D. x ¾ in. O.D. to 10 in. I.D. x 13 in. O.D.

CYLINDRICAL TOWER SECTIONS — Up to 38 in. O.D. x 33 in. I.D. x 36 in. long.

"National" and "Karbate" carbon and graphite products are resistant to the action of most acids, alkalies and other corrosive materials. They possess good mechanical strength, exceptional resistance to thermal shock, and are readily machined. Graphite and "Karbate" No. 2 pipe have heat transfer properties superior to most metal pipe of corresponding diameter.

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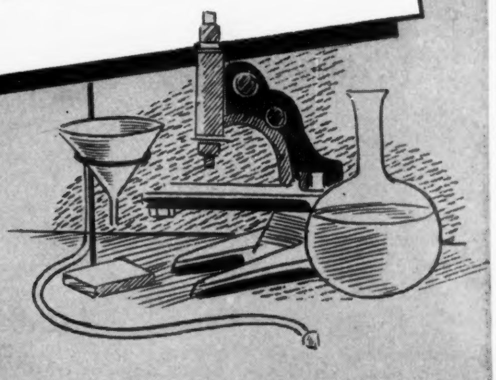

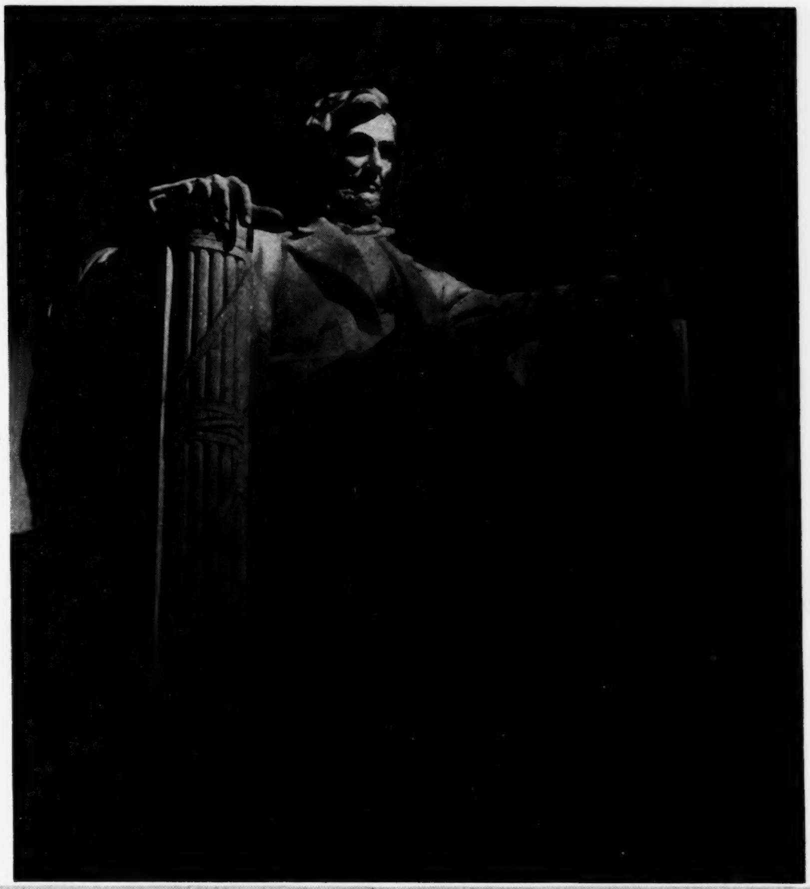

USEFUL PQ SILICATES OF SODA

RESEARCH laboratories are joining the ranks of overtime workers; they're busy looking into the future for new products or new ways to make old ones.

To all who use silicates of soda or could use them, there is something useful for them in the PQ experience. In a period of over 75 years, we have stored up a lot of practical information on the properties and uses of soluble silicates.

Consult us if you have a problem which involves a soluble silicate. Our bulletins have been a real aid to many investigators. For a complete list of PQ Bulletins, ask for Bulletin 174, "Publications on Silicates of Soda and their Applications".

PHILADELPHIA QUARTZ CO.

Established 1831 General Offices and Laboratory: 125 S. Third Street, Philadelphia, Pa.
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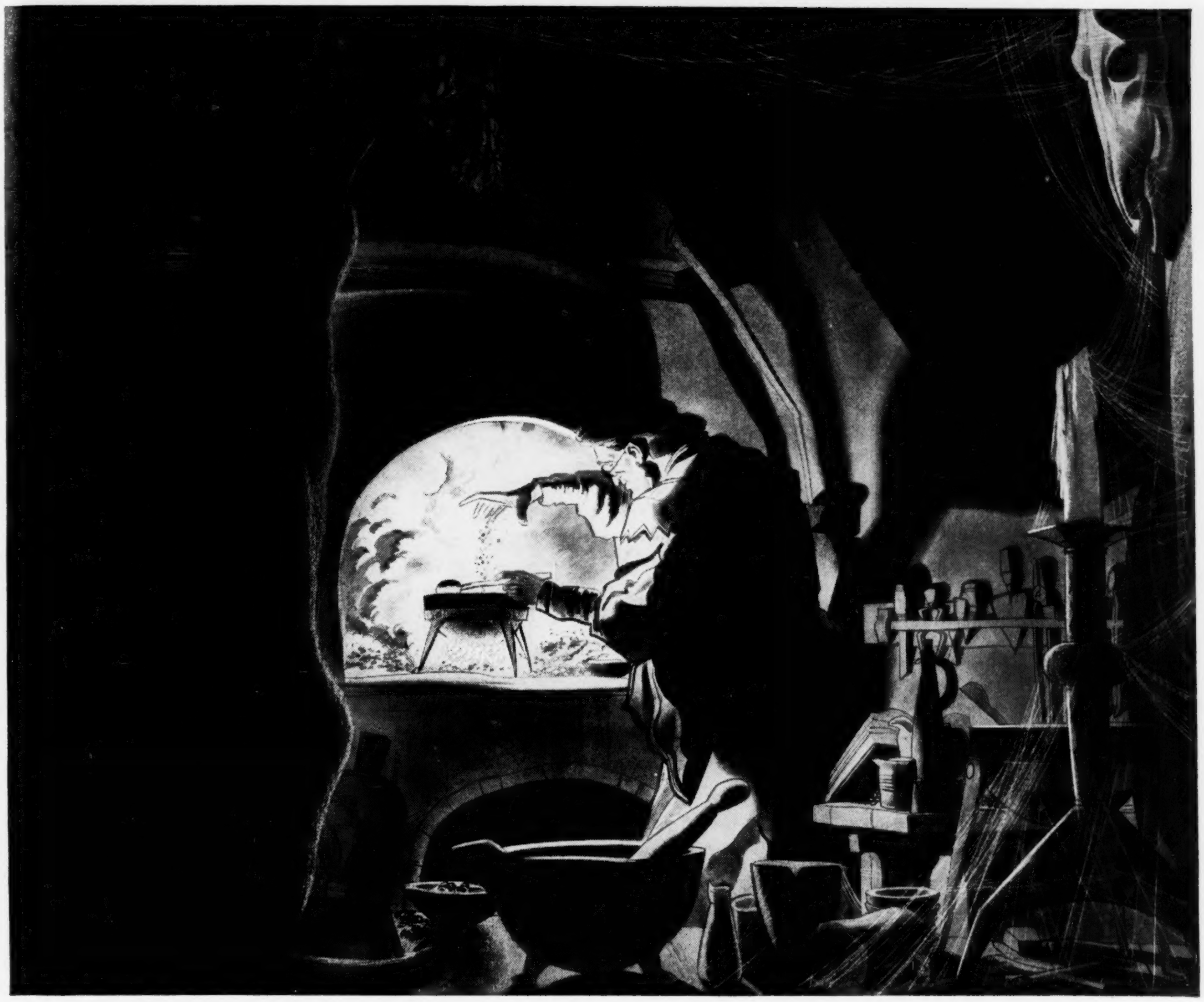

HE WOULD HAVE BURNED FOR THIS DISCOVERY!

WITH none but his cat to watch him, the alchemist in the Middle Ages worked at peril of his life, exploring the secrets of nature.

He was the father of modern chemistry. His quest was the "Philosopher's Stone"—a magic substance to change common metals into gold. But had he discovered wonders to compare with the miracles wrought by the modern chemical known as "Cumar"*... he would have been burned at the stake for trafficking with the devil.

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On rubber, Cumar confers new life and stretchability. And unlike many compounding agents, it blends equally well with natural or synthetic rubber—a characteristic of special significance today.

* * * *

This modern "Philosopher's Stone" is just one of a long list of coal-tar chemicals that have established Barrett's reputation for uniform, dependable products.

Perhaps you have a product that can be improved, a production schedule that can be shortened, or manufacturing costs that can be pared through the use of a coal-tar chemical. We invite you to drop a line to our experienced Technical Service Bureau, outlining your problem.

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DIMETHYLETHANOLAMINE
"CELLOSOLVE" BENZYLOXYGLYCOL

HERE are four new synthetic organic chemicals available in research quantities. They should be of special interest if you make emulsions, dyestuffs, pharmaceuticals, or rubber accelerators . . . if you use solvents for lacquers, dyestuff pastes, printing inks, or coating compositions . . . or if you can develop new products and processes using synthetic organic chemicals.

These chemical newcomers were synthesized in our laboratories, and the supply is limited. However, commercial quantities may be made available in the future when large-scale applications develop. Write for quotations.

For information concerning the use of these chemicals, address:

Carbide and Carbon Chemicals Corporation

Unit of Union Carbide and Carbon Corporation

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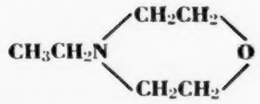
N-ETHYL MORPHOLINE



. . . is a colorless, water-miscible liquid boiling at 138°C. This cyclic tertiary amine is potentially useful as a solvent for dyes, resins, and oils, and as an intermediate in the manufacture of dyestuffs, pharmaceuticals, rubber accelerators, and emulsifying agents. Its molecular weight is 115.17; its specific gravity at 20/20°C., 0.916.

ACETOACET-O-TOLUIDIDE

$CH_3COCH_2CONHC_6H_4CH_3$

. . . is a fine, white, granular powder which melts at 106°C., and contains active methylene and carbonyl groups. It is very similar to acetoacetanilide and is also used as an intermediate in the manufacture of "Hansa" and "benzidine" pigments. It is slightly soluble in water and is soluble in dilute alkalies. Its molecular weight is 191.22.

DIMETHYLETHANOLAMINE
(Dimethylaminoethanol)

$(CH_3)_2NCH_2CH_2OH$

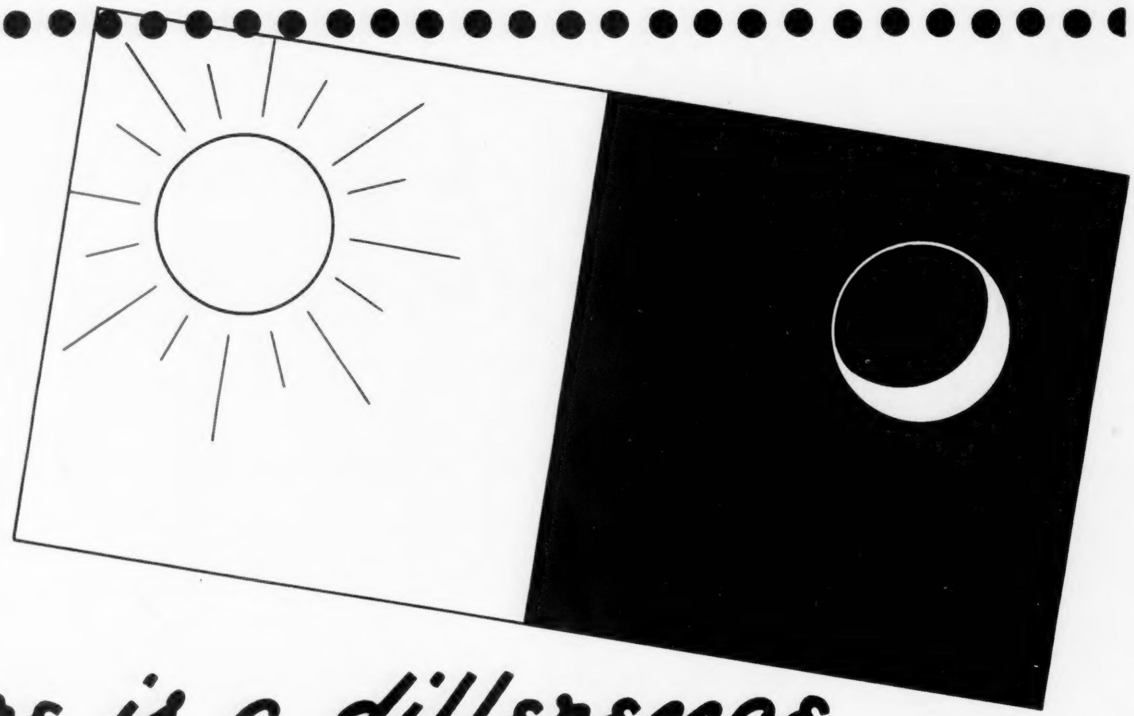
. . . is a colorless, amine-odored liquid which is miscible with water and benzene. Its properties are similar to those of diethylethanolamine (diethylaminoethanol) which has been used commercially for many years. It should be useful in the synthesis of dyestuffs, textile auxiliaries, pharmaceuticals, and corrosion inhibitors. Its physical properties include: boiling point, 133°C.; specific gravity at 20/20°C., 0.887; equivalent weight, 89; refractive index, 1.4300.

"CELLOSOLVE" BENZYLOXYGLYCOL
(Ethylene Glycol Monobenzyl Ether)

$C_6H_5CH_2OCH_2CH_2OH$

. . . has the high boiling point of 255.9°C., and its vapor pressure is about the same as "Cellosolve" Phenoxyglycol. It is well-suited as a high-boiling solvent in lacquers, dyestuff pastes, printing inks, and in coating compositions for paper, leather, and cloth. Its specific gravity at 20/20°C. is 1.0700. It is 0.4 per cent soluble in water.

PRODUCERS OF SYNTHETIC ORGANIC CHEMICALS

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in industry
Today, Defense and non-defense manufacturing has emphasized the ever-increasing uses and possibilities of the element ZIRCONIUM and its compounds in industry. TAMCO Zirconium compounds are being used successfully in the manufacture of Refractories, Electrical Resistors, Resins, Dye Extenders, Water Repellents, Catalysts, Abrasives, and Ceramics.
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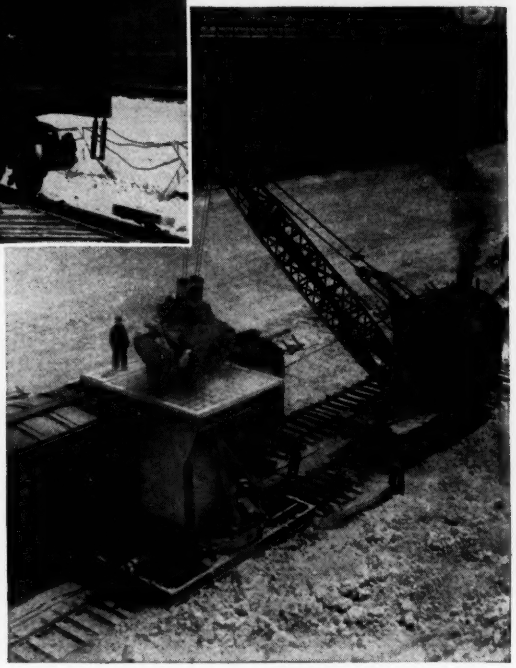
Interesting Facts about
SULPHUR
not Generally Known



Loading

It's no small job to load Sulphur and expedite its shipments to industry. At our Newgulf mine, locomotive cranes equipped with clamshell buckets take two tons at a bite. The Sulphur is loaded directly into gondolas for shipment to Galveston or into box cars by means of special loaders. ★ At Newgulf, as many as 170 cars or more than 10,000 long tons of Sulphur have been loaded in a single day. This requires ten miles of loading track, company-owned locomotives, roundhouse facilities, hoists and accurate weighing equipment, and the team work of many skilled operators. ★ Modern loading facilities such as these together with ample stocks assure a speeded-up industry that all demands for Sulphur will be met promptly.

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LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES
CHEM-O-GRAM

WASHINGTON
PRICES
PERSONNEL
EXPORTS

IMPORTANT

Emphasis is now on Conversion

Nelson, WPB Chief, addressing business paper editors and publishers in special meeting on Feb. 13 in Washington, asked cooperation in getting following message over to the 184,600 manufacturing establishments in the U. S. and to management:—Year 1942 is the critical year in the existence of the U. S. Every weapon now is worth 10 times what we might produce next year. Country must stop thinking about what we can do to the enemy in 1943 and start thinking about what we're going to do to him in February and March of 1942. We have no more golden months—just 10 silver months. We can't depend upon building new plants but must CONVERT present and existing plant facilities to defense work NOW. Still too much smugness on part of some industrialists. We stand in grave danger of being LICKED unless the all-out war effort starts IMMEDIATELY. War Production Chief asks that industrialists take initiative on conversion—don't wait for the government to do it. Show just as much go-get-it spirit in seeking government contracts as exhibited in getting private business. Sub-contract where possible. Increase number of shifts so that equipment is used greater number of hours. CONVERT TO WAR WORK NOW!

WASHINGTON:—Truman Committee, according to Senator Brewster (Rep., Me.), "will launch investigation that will tear lid off rubber situation in this country." (See editorial page 172.) Senator Brewster reported stating in interview in Akron Beacon Journal investigation will be a closed session. Ickes maps for Senate plan for 17 power projects and wide use of low grade minerals and ores. As part of plan he urges that "all enemy alien patents and processes are to be examined and tested, while all American owned patents and processes for minerals needed for winning the war should be made available for the confidential use of the Bureau of Mines with a view toward "recommending most effective processes." New War Shipping Administration created by President Roosevelt to regulate "operation, purchase, charter, requisition and use of all ocean vessels of U. S." A Pacific shipping surcharge of 13% approved by Maritime Commission. A 3-man Plan Board soon to be named by Nelson will do the "heavy thinking" on production and procurement problems.

PRICES:—Effective Feb. 16 salicylic acid is under price ceiling. Sulfonated castor oil prices are up with 50% at 10¢ carlots. Castor oil stocks are extremely short. Dehydrated advanced 1¢. Vitamin A is under full allocation and vitamin C has a price ceiling. Calcium arsenate upped 1/2¢ in carlots and 3/4¢ in l.c.l. lots.

EXPORTS:—Board of Economic Warfare on Feb. 12 took drastic action to prevent excessive export drains of medical or pharmaceutical products by issuing still more detailed licensing controls. Same Board has also tightened rules on exports in drums so as to further conserve steel stocks.

M.C.A. ANNUAL MEETING:—War brings change in MCA plans. 70th annual meeting will be held June 4, Waldorf, New York, with closed session on the chemical industry and war program. Dinner will be held in the evening with special speaker to be announced later.

BENZOL:—Movement under way to ease various state regulations forbidding use of benzol or benzol products under certain conditions as one way of easing shortage of toluol. WPB said to be discussing problem informally.

CHEMICAL INDUSTRIES CHEM-O-GRAM

SPECIAL—WBP PERSONNEL

From thoroughly reliable sources comes the story that Dr. C. W. Reid will become Chief of the Chemicals Branch of WBP and that Dr. E. R. Weidlein, Director of Mellon Institute and now in charge of the Chemicals Branch will become Chemical Advisor to the Division but will take over full charge of a synthetic rubber program. Actually, it is understood the affairs of the Division have been conducted in this manner for several months.

PATENTS:—Mathieson Alkali announces company upheld in patent dispute on process of utilizing oyster shells in lime making. Suit was instituted by W. D. Haden Co., Houston, Tex., on basis of Patent No. 1,896,-403. U. S. Supreme Court refused to review decision of Circuit Court of Appeals for the 5th Circuit which had been favorable to Mathieson.

CHEMIST ADVISORY COUNCIL:—Board of Directors of Council has voted to disband organization and to discontinue services in behalf of chemists and chemical engineers. Lack of funds given as principal reason. Movement under way for American Institute of Chemists to take over Council and to place it in a "standby" state until needed after present war emergency.

MAGNESIUM:—According to unofficial sources, believed to be reliable, metallic magnesium will be produced by the Pigeon Ferro-Silicon process, developed in Canada at McGill University, at plants to be operated by New England Lime, American Metal, Ford, Electro-Metallurgical, and Permanente (replacing in the latter case the Hansgirg process). Raw materials are: 12 tons of stone (coarse crystalline marble type dolomite), 6 tons of lime, 1 ton of ferro silicon, to produce 1 ton of 99.97% metallic magnesium. Present production plans are said to call for at least an output of 75,000,000 lbs. annually by this process, but may later be doubled.

It is reported on reliable authority that the New York Chemical consultants, Singmaster & Breyer, are likely to be the design engineers for these plants.

PETROLEUM:—With serious loss of tankers on East Coast rationing of some type is expected very shortly. Restriction in use of natural gas for home heating announced.

STEEL CONSERVATION:—Specific recommendations for conservation of steel in a wide range of uses has been made to WPB by the Engineers' Defense Board, technical group sponsored by five engineering societies including the A.I.Ch.E. Additional information available from the Defense Board, 29 W. 39th st., N. Y.

TUNGSTEN:—WPB issues M-29-b prohibiting use of tungsten in grinding wheels, gauges, and as a coloring material for rubber, linoleum, paper or other similar materials after May 1. Until that date, use of tungsten in these items is limited to 17 1/2% of the amount used during the year ended June 30, 1941.

DEFENSE BONDS:—Charles T. Thompson, president, Thompson-Hayward Chemical, reports all of company's 1942 profits will be invested in defense bonds or presented as an outright gift to some government agency or activity.

GLYCERINE:—Soap producers were in Washington recently to be asked to modify their production methods so as to obtain the maximum amount of glycerine. Soapers who do not recover must ship waste to plants where recovery can be made.

CHEMICAL INDUSTRIES

Dollar-A-Year Men In Washington

CERTAINLY one of the most constructive moves that Donald M. Nelson has yet made in Washington as head of the War Production Board has been his wholehearted defense of the dollar-a-year men. In unmistakable language he has made it perfectly clear to Congress, the country at large and to certain elements in the Administration that if we are to win this war we must utilize to the fullest extent the best industrial brains of the country. War today is industrialized warfare and the place to secure the necessary competent brain-power that knows how to get mass production rolling is in industry.

The history of our defense-war production program is filled with notable examples of costly delays caused by a policy of the Administration of refusing in numerous instances to put in charge the right man in the right place because of so-called "company or industry connections." Such a policy, of course, was the inevitable result of the Administration's mistrust of what is loosely termed "Big Business." Fortunately it now appears that the inhibitions of the long-haired theorists have been sidetracked and that the Nelson "type" will be given a green light in directing our greatly intensified war program.

In plain language this means that still greater numbers of key business executives with highly successful records of getting things done will be "drafted" in the near future for war work. It is expected in Washington that many such calls will go out to industrial concerns in the very near future requesting the services of certain executives in putting over what the chief of the War Board has aptly described as the "biggest production job in history."

In his off-the-record talk last month to industrialists in New York Mr. Nelson indicated that what Washington needs most are capable production and procurement executives who can assist army and navy personnel in solving knotty bottlenecks which are constantly arising to plague the war program. It is understood that the WPB has already compiled quite a list of men whose services are desired in addition to the hundreds of business executives who have already gone to the Capital in the service of their country.

When the call comes it will be answered promptly and enthusiastically. But it will mean that considerable amount of good judgment must be exercised in the selection of those who go to Washington and those who stay "at home" to keep the wheels of industry running at top speed. The best brains are urgently needed in both places. The problem of making selections by the top executives of companies will not be easy because of the numbers involved. In the chemical group alone in Washington the personnel has grown from three to several hundred and unquestionably must be augmented still further. There will be plenty of Sunday work and we doubt all of it will be on double pay!

CI EDITORIAL

Walter J. Murphy, Editor

Solving the Rubber Problem: Announcement of Jesse Jones, Federal Loan Administrator, that synthetic rubber production is to be expanded in 18 months to a rate of 400,000 tons per year appears to be somewhat on the optimistic side. The studied opinions of several experts given privately indicate we will be quite fortunate if a productive capacity of 200,000 tons annually is available by the middle of 1943. Anything above this figure will be pretty close to a miracle.

Whether or not Mr. Jones expected that his announcement was going to discourage our enemies is difficult to determine, but it is quite evident that his statement has had repercussions here. The American public and a number of American manufacturers who employ rubber in one form or another were suddenly raised from the depths of despair to a feeling that the rubber problem is practically solved and that there is little or no reason for any further conservation and governmental control measures. It has been quite evident in Washington in the last few weeks that many manufacturers have felt that the War Production Board was unduly pessimistic and arbitrary and should loosen up immediately on the available rubber stocks. Fortunately it appears that rubber experts in Washington are not being stampeded into any such nonsensical action.

It is important to look certain facts in the face. In 1941 our synthetic rubber production amounted to less than two per cent of our total crude rubber consumption. Can we in one and one half years step this up to fifty per cent of our consumption at a time when tremendous difficulties are bound to be met in obtaining raw materials, metals for equipment and trained personnel to operate? And, further, it should be stated that if such a program actually is reached in 18 months that then production will only be equal to about half of our normal requirements plus the tonnages necessary for waging war on the stupendous scale that is planned for 1943 and 1944. To encourage the American public in the belief that the rubber shortage is a very temporary affair is dangerous. It is likely to be a long time before John Q. Public will be able to walk into a tire store and buy what he wants and thinks he needs. The truth is much better even if it hurts than to hold out utterly false hopes.

The present situation in rubber is, incidentally, a perfect example of the waste usually involved when war forces technical developments along at a greatly accelerated pace. There is every reason to believe that in erecting and operating the plants called for in this half a billion dollar program that much of the present chemical technology of synthetic rubber production will be rendered obsolete. The same experience in peacetime could, of course, be obtained much more economically, but war is all that Sherman said it was on human beings, and, in this day and age, on pocket books as well.

From a purely technical point of view developments in the next two years in synthetic rubber are likely to be extremely interesting. While the petroleum industry is fully expected to provide a necessary raw material (butadiene), it is interesting to note that chemurgists are pushing the possibilities of a process which utilizes farm crops for the manufacture of 2, 3-butylene glycol with subsequent conversion to butadiene.

Briefly the process is described as follows: (1) The 2, 3-butylene glycol is produced by fermentation of sugar or starches. (2) The solution is then evaporated to one-third of its original volume. (3) The next step is the removal of glycol by solvent extraction or distillation. (4) The glycol is then converted to butadiene by means of a vapor phase catalytic process. It is also reported that considerable work has been done along the lines of preparing a number of vinyl compounds from alcohol and glycol, and that at least two of these are said to be satisfactory for interpolymerization with butadiene to make rubber.

As to the economics the following figures are offered by the chemurgists. It is said that the two principal ingredients can be made from farm crops at no more than ten cents per pound. Two hundred bushels of grain (56-pound bushels) will yield about one ton of rubber. As a conclusion it is pointed out that but from five per cent of the average corn crop of 2,500,000,000 bushels can be made some 600,000 tons of rubber. Proponents of the process say that with proper cooperation it is possible to have commercial production in about a year. A pilot plant is being erected at the Regional Research Laboratory at Peoria to study the process.

"C. I." In Wartime: Very naturally a war status has a very pronounced effect on what can and cannot be said in business journals for the duration. This is specially true of papers serving the chemical industry which is so closely allied to America's war program.

Yet in all its years of activity never has the opportunity been greater for CHEMICAL INDUSTRIES to perform outstanding services. Just how well this change in status has been met in this issue you as readers will judge.

But for the record the editors would like to call particularly to your attention the Statistical and Technical Data Section which contains as a special feature a digest of all governmental orders to date affecting chemicals (priorities, price ceilings, allocations, etc.).

And, of course, proper maintenance of equipment is always important but doubly so when maximum production must be maintained in our plants and replacements are difficult to obtain. So we recommend "Instrumentation and Automatic Control," page 210, to plant managers and superintendents for its very practical suggestions on how best to handle the problem of care and maintenance of electrical recording and control devices.

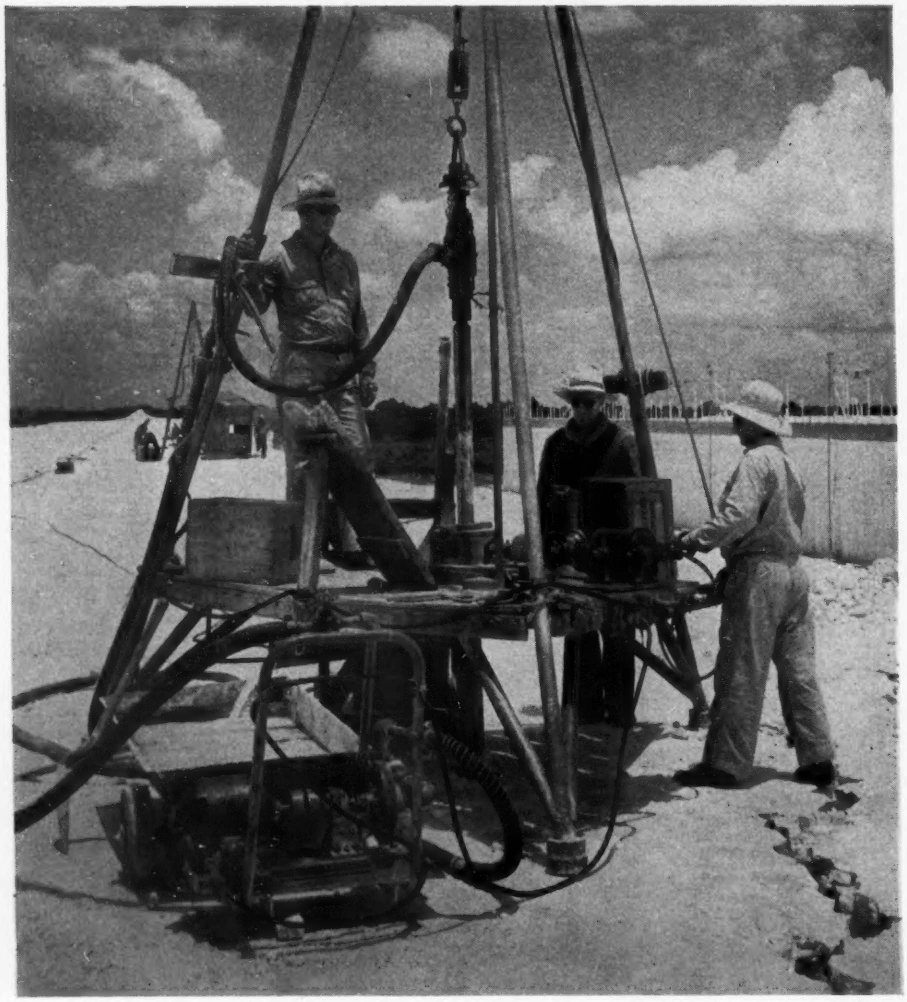
And above all do not fail to read "Bonds for Victory" which will tell you just how and what the chemical industry is doing as its share in helping finance Uncle Sam's fight and how executives in the industry may assist in this drive.

"A Saga of Salt" introduces a series that the editors of CHEMICAL INDUSTRIES have long contemplated. It now seems most fitting for several reasons to begin to record the histories of many of our leading chemical companies. From time to time others in this series will appear.

SULFUR'S ROLE IN INDUSTRY

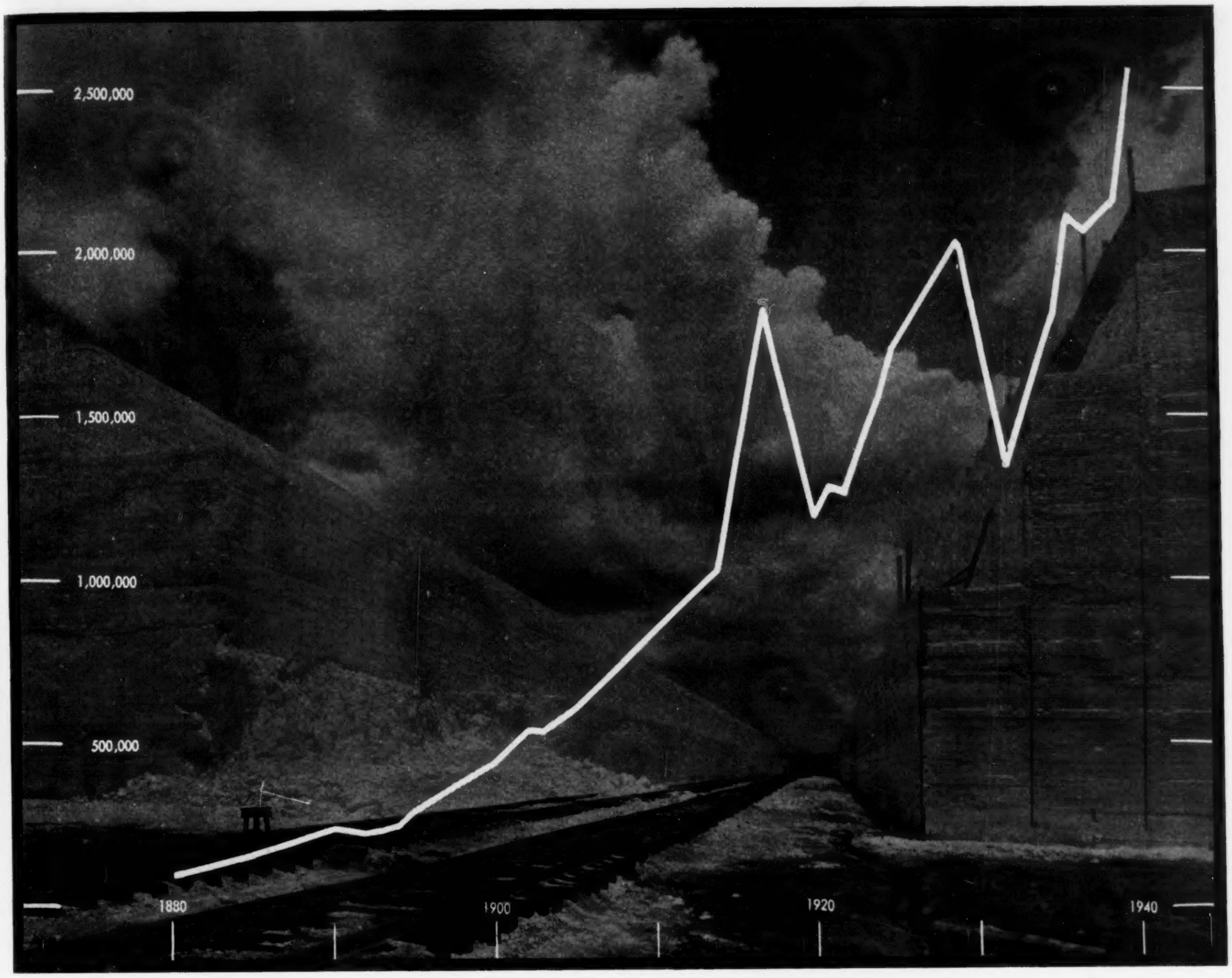
Versatile and vital, sulfur is very closely related to the development of all American industry as well as the chemical industry. Here's why.

By W. W. Duecker and E. W. Eddy
Texas Gulf Sulphur Company, Inc.



Above, mechanical loading device at Galveston (Tex.) docks. Left, crew drilling blast holes in sulfur vats prior to dynamiting for easy handling in the loading operation. Note the glasses.

MANY years ago chemists believed in phlogiston. This phlogiston was said to be a type of sulfur, a very subtle matter capable of penetrating the densest substances. In many respects chemists of today might also call sulfur "a very subtle matter." It penetrates many industries. It takes on many forms and adapts itself to varying conditions and situations. When a new industry is born, as likely as not you will find that sulfur in one form or another has had a part in it. Changes in technique or procedure may for a time diminish its importance in the manufacture of a given commodity. But it is equally probable, with its seeming vitality and demonstrated versatility that it will adapt itself to the situation and even help in displacing the product it had helped to create. Naturally it will be impossible to trace sulfur through the ramifications of industry, or list its multifarious uses in history, but in the following paragraphs, an attempt will be made briefly to trace some of the influences that sulfur and particularly sulfuric acid have had on the development of American industry. As nearly 90 per cent of all sulfur used is burned to sulfur dioxide, many sources of raw material are available to sulfur consuming industries. Accordingly, no attempt has been made to



Sulfur consumption by total U. S. industry. All forms (sulfur, pyrites, smelter gas). In equivalent 1,000 gross tons. 3-year averages, centered.*

differentiate between the various materials, brimstone, pyrites, sulfide ores which constitute the source of this essential element.

The Textile Industry

Soon after the Colonies established their independence, woolen and linen goods were produced for domestic and foreign sales. A demand for sulfur for stoving or bleaching woolens was thus developed. It was discovered that sulfuric acid could be used in place of sour milk in the bucking and souring of textiles. This no doubt influenced John Harrison when he established in Philadelphia in 1897 a sulfuric acid factory having a capacity of 300 carboys of acid a year. Soon, with aid of sulfuric acid he also began the manufacture of alum, copperas and other chemicals used by the textile industry. Thus the establishment of one of the first industries in the United States coincides with the first industrial use of sulfur in this country. And, as the industry expanded, uses were found for other sulfur compounds. In 1788 Berthollet demonstrated that chlorine produced with aid of sulfuric acid could be used to bleach cotton goods and other textiles. Prompted by this the Lowell Bleachery, operators of cotton mills in Lowell, Mass., in 1840 built a sulfuric acid plant next to their print works and dye houses to produce chlorine for a bleaching system. Charles Lennig used the same acid in the manufacture of bleaching powder in Philadelphia in 1847. Nitric, hydrochloric and acetic acid were produced, and, since the production of these acids required sulfuric acid, the demand for it increased.

Although a need for sulfur seemed well established, a new development decreased the sulfuric acid requirements of the textile industry. In 1890 Castner perfected his cell for the production of electrolytic alkali and made it possible to produce chlorine without aid of sulfuric acid. The year 1892 saw the actual production of electrolytic chlorine for bleach by the Electrochemical Co. at Rumford Falls, Maine. But at about the same time that Castner

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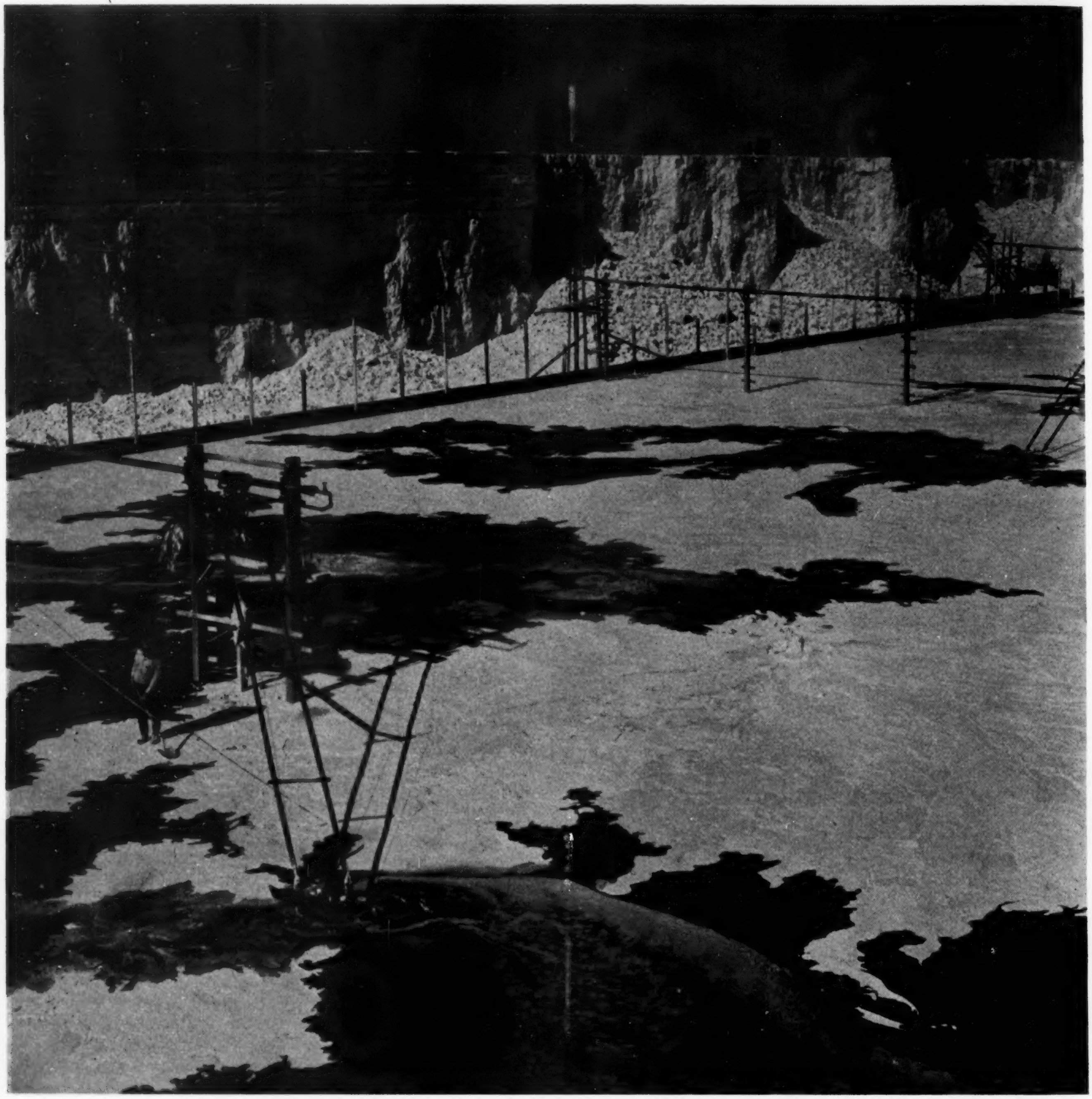
*Production and shipments of all forms of sulfur, as well as imports, are reported by the Government in "Mineral Resources of the United States" for the years through 1931 and since then in "Minerals Yearbook." Sulfur content of the domestic pyrite has been published in recent years and in earlier years content is estimated to average 40%, while sulfur content of imported pyrite is estimated at 45%. Since 1927 "Chemical and Metallurgical Engineering" has estimated U. S. consumption of sulfuric acid and crude sulfur by industries. Their estimates are used, and in some of the latter years adjusted to conform to the total sulfur materials available for consumption. In a Department of the Interior publication "The Manufacture of Sulphuric Acid in the U. S.," published in 1920, distribution of sulfuric acid to industries in 1918 is reported. The consumption of sulfur will vary considerably in some years from the reported shipments due to variation in inventories at the consuming plants. For this reason all shipment figures were averaged for three years to reduce the variation between shipments and actual consumption. Distribution in the early years is estimated from data on phosphate rock shipments and production of sulfite pulp.

As nearly 90% of all sulfur used is burned to sulfur dioxide, many sources of raw material are available to sulfur consuming industries. Accordingly, no attempt has here been made to differentiate between the various materials, brimstone, pyrites, sulfide ores which constitute the source of this essential element. The total sulfur available to United States industry has been calculated for the years from 1880 through 1941 and allocated to the major consuming industries, and charted to show periods where major changes occurred in each industry. Many important sulfur using industries such as rubber and insecticides have not been discussed because of limit of space. No attempt is made to comment on economic factors affecting the industry, and only the primary use of either sulfur or sulfuric acid is indicated. For example, only the acid used by the petroleum and textile industries is tabulated. Other chemicals used in these industries such as carbon bisulfide for rayon, are grouped under "Chemicals."



Atop a sulfur storage vat, each of which holds one-half million tons. Here you can see the pile being broken down. In the foreground the sulfur is coming in from the wells and is being spread in thin layers to help it cool. Mechanical contrivances are distributors. Piles of broken sulfur in the background are made by blasting with explosives.

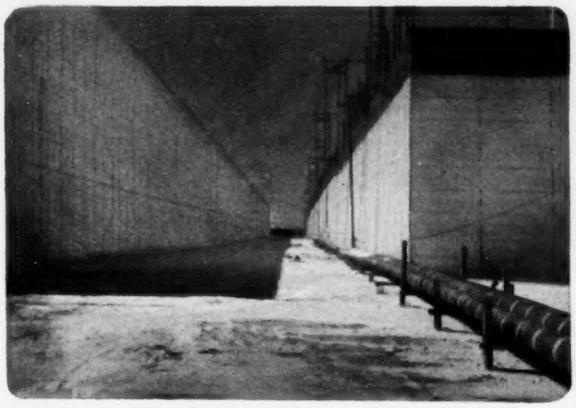
was developing a process which decreased the requirements of sulfuric acid by the textile industry, Cross and Bevans perfected a new synthetic fiber, viscose rayon. Some twenty years later in 1911 when the production of rayon was started in the United States, the textile industry not only became a larger consumer of sulfuric acid, but also of carbon bisulfide. The uses for viscose multiplied. It was converted into cellophane, sausage casings and a variety of new fabrics. Thus, sulfuric acid, supplanted by the introduction of electrolytic chlorine, through the development of the rayon industry became with sulfur even more important factors in the textile industry than formerly was the case.

A few years later another new synthetic fiber, cellulose acetate, appeared on the market. With the development of this fiber a new sulfur compound made its appearance in the textile industry. The manufacture of cellulose acetate required sulfuric acid and acetic anhydride. The manufacture of acetic anhydride required sulfur chloride. The textile industry now became an important consumer of not only sulfuric acid and sulfur, but also carbon bisulfide and sulfur chloride.

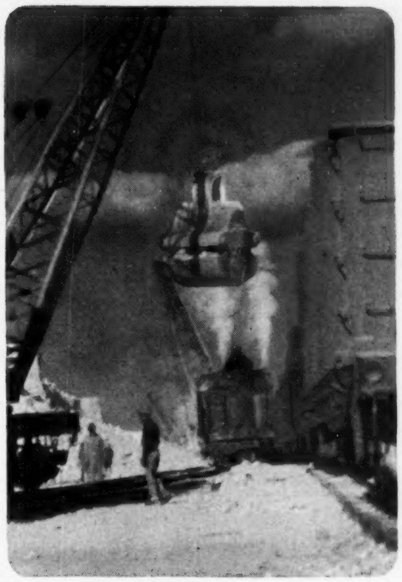
The expansion in the use of synthetic fibers, and the development of staple fiber in 1928 increased the market for sulfur compounds. The market was further increased by the development of special chemicals such as sulfonated oils, dyes, and the sulfated alcohols which are used as wetting or cleansing agents. These seem to flow in endless variety from industries' laboratories.

Two developments made in 1938, had an effect on the consumption of sulfur by the textile industry. A process developed for making acetic anhydride without aid of sulfur chloride resulted in a diminished use of sulfur compounds in the industry but in the same year, sulfamic acid was developed as a fire-proofing agent for textiles. The latter is made with fuming sulfuric acid. Thus in the progressive textile industry sulfur seems constantly to reappear in new and unusupected roles, and the

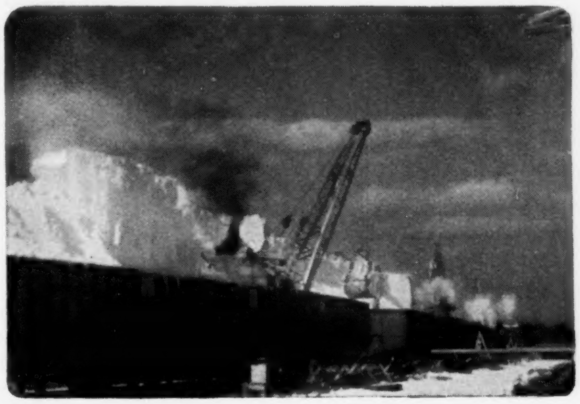
Modern Sulfur Mining Operations at Newgulf



Another view of the huge sulfur vats. There is no worry about shortages of sulfur. Tremendous stock piles assure American industry of adequate supplies.



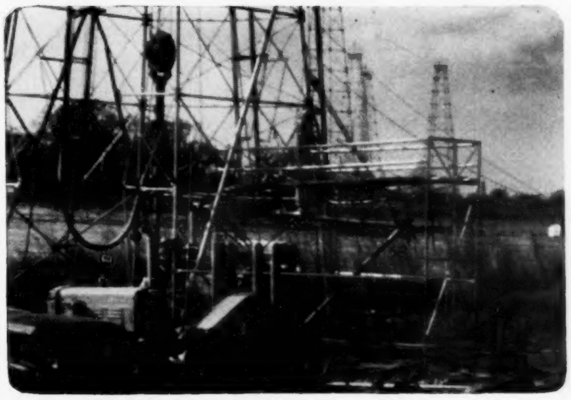
Loading sulfur into boxcars.



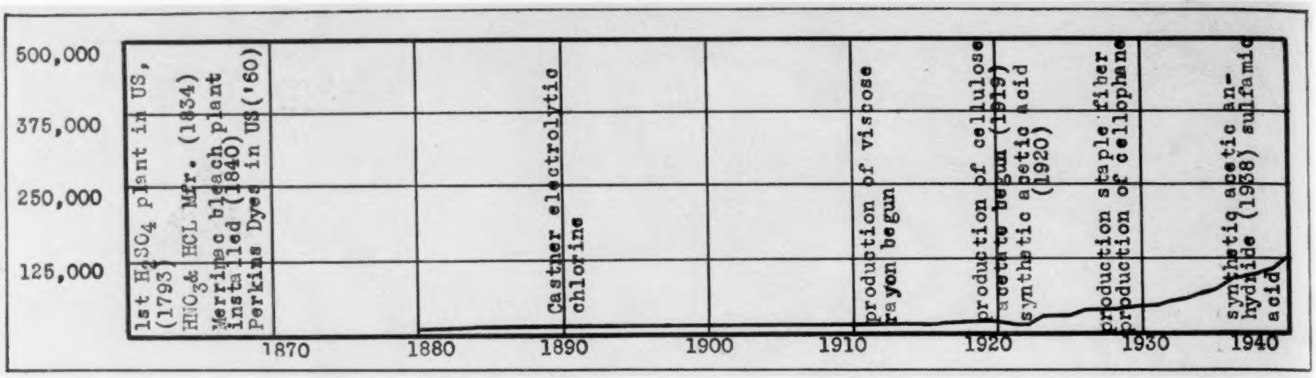
Loading gondola cars with sulfur. Note the clamshell loader which was in the vertical picture. Blasting operation described before makes this operation easy.

Collecting sumps. Sulfur from a number of wells discharges in these sumps prior to its journey to the nearby huge sulfur vats for cooling and solidification.

Bleed water purification plant. Here spent water from the wells is tapped off and purified before it is allowed to go as wastage into the nearby streams.



Modern well-drilling rigging which Texas Gulf Sulphur uses in its operations. A new well is being sunk here. Note motor equipment at bottom of photo.



Sulfur consumed by textile industry. All forms (sulfur, pyrites, smelter gas). In equivalent 1,000 tons. 3-year averages, centered.

industry which was responsible for the first production of sulfuric acid in the United States continues to be an important consumer of sulfuric compounds.

The Fertilizer Industry

The early agriculturalists having rich forest land available found little need for fertilizers. This was not universally true, however, when Liebig called attention to the importance of phosphates as fertilizers, or when in 1850 William Davison erected a sulfuric acid plant in Baltimore for the acidulation of phosphate rock and thus took the initial steps in the creation of the fertilizer industry.

Other acid plants were established and the fertilizer industry grew, to be retarded somewhat by the Civil War, but to show renewed life soon thereafter in the establishment of scores of fertilizer plants. By 1884 there were 278 fertilizer plants which consumed 45 per cent of all the sulfuric acid produced in the United States. Most of these plants were located in the South close to the markets and to the phosphate rock deposits which had been discovered in South Carolina, Florida and Tennessee.

Although few outstanding changes seem to have occurred in the industry, inventors have devoted much time and thought to improving processes and methods of manufacture. Many efforts have been made to replace sulfuric acid. In 1878, basic slag for fertilizer purposes was made in a blast furnace from iron ore containing phosphorus. Since that time various other attempts were made to use heat in the production of fertilizers. Phosphate rock was calcined with silica in 1897. In 1917, the United States Bureau of Soils started experiments on volatilization processes, and in 1920 the Federal Phosphate Company initiated the production of phosphoric acid by electric furnace methods. Today a considerable portion of the elemental phosphorus and chemically pure phosphates used in industry are made by electric furnace methods. They are used in the production of a multitude of new compounds adapted to wide variety of uses. They include plasticizers for the plastics industry, phosphates for baking powder and complex phosphates for softening water.

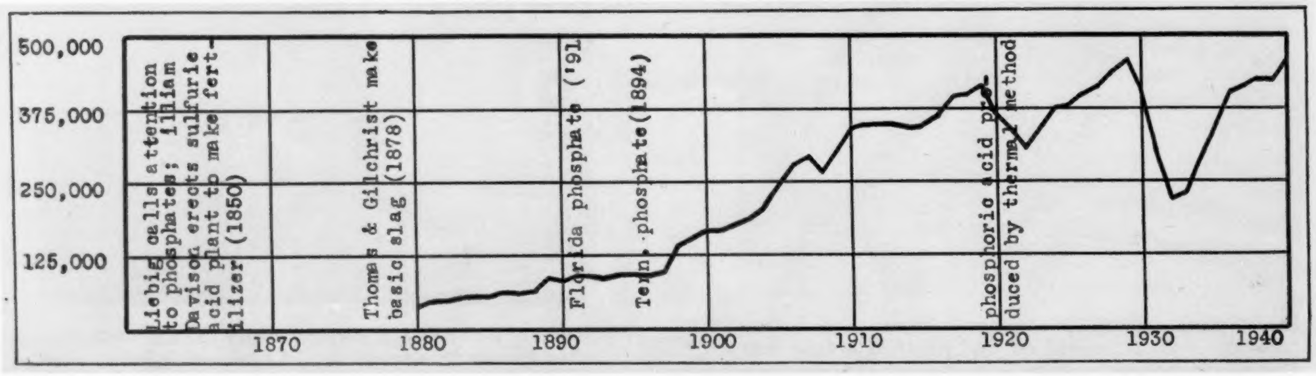
Contrary to its habit in some industries, in the fertilizer industry sulfur still retains the same form it assumed when it helped to initiate the industry. Due to its ease of application, its cheapness, and the enterprise of fertilizer manufacturers, sulfuric acid continues to be the most practical reagent to use in the production of phosphate fertilizers. It has done its job well and with a constant improvement in the quality of fertilizers produced; 11 per cent available phosphorus pent oxide which resulted from early operations was a far cry from the more than 18 per cent of this valuable plant food which is available in superphosphate today.

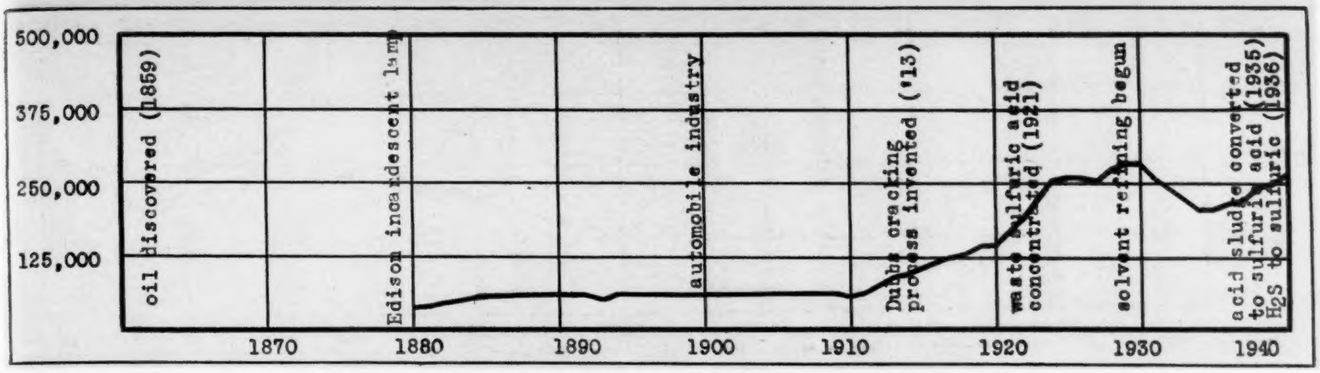
The Petroleum Industry

The petroleum industry started when Drake discovered oil at Titusville, Pa., in 1859. As in the case of the textile and the fertilizer industry, sulfuric acid helped to establish this industry for its principal products were kerosene and lubricants, both of which were refined with that acid. Outstanding factors affecting the consumption of acid in the industry were Edison's development of the incandescent lamp in 1879; the development of the Welsbach gas mantle in 1885; the growth of the automotive industry.

Edison's invention, the introduction of gas lighting and the growth of the automobile industry, caused the petroleum industry to vary its yields of saleable products. In 1890 the products obtained from one barrel of crude oil comprised 65 per cent kerosene and seven per cent lubricants; by 1900 refining processes had been changed to yield 55 per cent kerosene, 14 per cent gasolene and 10 per cent lubricants, and in 1930 the products consisted of six per cent kerosene, 52 per cent gasolene, four per cent lubricants, and 40 per cent fuel oil, the latter change in yield resulting from cracking processes initiated by Dubbs in 1913. Since gasolene did not require as drastic treatment with sulfuric acid as did kerosene, the quantity of sulfuric acid per unit of product declined. Clay, zinc chloride, etc., could be used to remove some of the impurities formerly removed by sulfuric acid. As a result, instead of about ¼ pound of acid to refine one gallon of gasolene, as was formerly the case, the same result could now be obtained with 1/10 pound. New methods were also applied to the refining of lubricants involving the use of liquid sulfur

Sulfur consumed by fertilizer industry. All forms (sulfur, pyrites, smelter gas). In equivalent 1,000 tons. 3-year averages, centered.





Sulfur consumed by petroleum industry. All forms (sulfur, pyrites, smelter gas). In equivalent 1,000 tons. 3-year averages, centered.

dioxide, nitrobenzene, furfural, and propane.

Other developments contributed to the overall decrease in the consumption of sulfuric acid in the petroleum industry. In 1921 Simonson Mantius installed at the refinery of the Vacuum Oil Co., Paulsboro, N. J., equipment for recovering acid which had been used to refine gasoline. In 1935 the Chemical Construction Company developed equipment which made it possible to recover the sulfuric acid which had been used to refine lubricants. More recently sulfur has been extracted from petroleum products by recovering the hydrogen sulfide evolved in refining operations and converting it to sulfuric acid.

It is thus evident that sulfur plays a peculiar role in the petroleum industry. It is present in petroleum as an impurity. Yet sulfuric acid, sulfur dioxide and even sulfur itself are used as purifying agents. Furthermore, sulfuric acid and other sulfur compounds assist in the production of the host of specialties consumed by the petroleum industry such as dyes for gasolene, lead tetra-ethyl for anti-knock gasolene, anti-oxidants and organic stabilizers. Likewise, extreme pressure lubricants, and cutting oils that help speed production may contain up to 18 per cent of added sulfur.

Since 1859, when sulfuric acid was first used to refine kerosene, the unit of sulfur required to refine a given petroleum product has undoubtedly declined. But sulfur in its various forms still exercises a vital function in the petroleum industry. Due to the enormous expansion of this industry it ranks high as a consumer of sulfuric acid. And, if as has often been prophesied, the petroleum industry should in the future become an important producer of synthetic organic chemicals other than gasolene, etc., it will still find sulfuric acid a valuable tool.

Coke and Steel

Although some sulfuric acid was undoubtedly used at an early date for cleaning and pickling various manufactured iron products, the steel industry at its inception could not be classed as a large consumer of acid. It was not until the production of tinplate was begun in 1890 and the galvanizing of metal was undertaken in a large way that a definite demand for acid was created. As this industry expanded with the development of the canning industry, and as the demand for sheet steel grew as a result of the automobile industry, the consumption of acid increased.

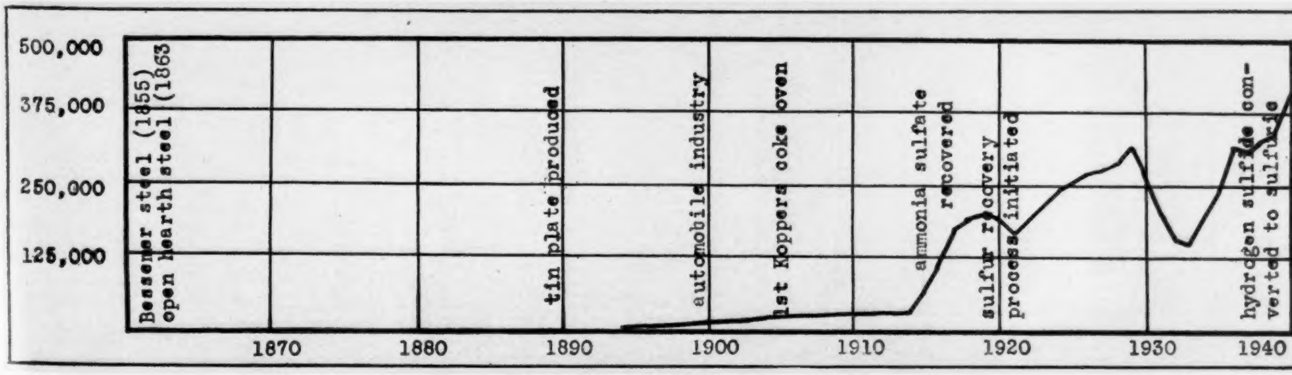
The adoption of the Bessemer process created a demand for coke, and after the United States Steel Company was formed, a Koppers coke oven was built by this company in 1906. The ammonia liberated in the coking of coal was usually recovered as ammonia liquor. In 1914, however, when the country was in desperate need of nitrogen for the explosive industry, processes were installed for the recovery of ammonia from coke oven gas with aid of sulfuric acid. Thus another outlet for acid developed.

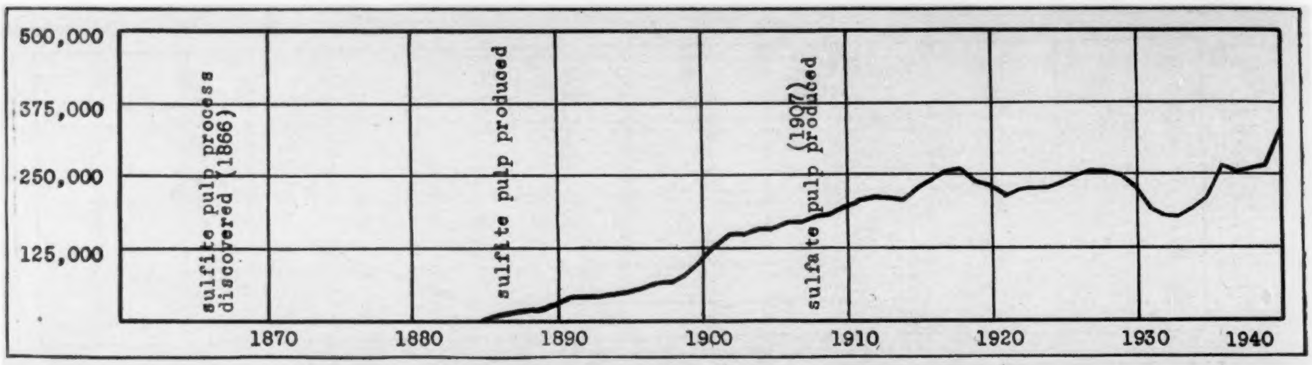
In the manufactured gas industry, however, sulfur was usually removed by reaction with iron hydroxide. With the installation of the Koppers coke oven, attention was accorded the more efficient removal of such sulfur compounds. A continuous process was developed in 1920 but the sulfur so removed was wasted. Later, the Koppers Company developed the Ferrox, the Nickel and the Thylox processes by means of which the sulfur removed could be recovered. Subsequently came the development of the Girdler, the Phenolate and the Phosphate process. All of these were applicable not only to the recovery of sulfur from coke oven gas but to the treatment of refinery and natural gases as well. An industry requiring large quantities of sulfuric acid now finds itself in the role of a producer of small quantities of sulfur.

Pulp and Paper Industry

In the early days wood pulp paper was made by mechanical processes or with aid of caustic soda. Sulfur entered the industry when Benjamin Tilghman in 1866 called attention to the fact that wood pulp could be made by cooking wood in water containing calcium or magnesium bisulfite, but it was not until 1885 that the process was placed in commercial operation and the pulp and paper industry too, became a quantity consumer of sulfur. That it is a quantity consumer cannot be doubted when it is realized that today approximately 250 pounds of sulfur is consumed in the production of one net ton of sulfite pulp. Sulfite pulp is a standard raw material for the paper industry, and

Sulfur consumed by coke & steel industry. All forms (sulfur, pyrites, smelter gas). In equivalent 1,000 tons. 3-year averages, centered.





Sulfur consumed by sulfite pulp industry. All forms (sulfur, pyrites, smelter gas). In equivalent 1,000 tons. 3-year averages, centered.

it is now used not only for the manufacture of paper, but also for the manufacture of rayon, other synthetic fibers, and cellophane. It has also been used as a source of cellulose in the production of high explosives. This expansion of the sulfite pulp industry, as might be expected, has contributed greatly to the expansion of the market for sulfur.

Soon after the sulfite pulp industry was well established a competitive pulp appeared. In 1907 pulp was produced by the sulfate process. Here again sulfur entered the pulp industry, but this time in the form of sodium sulfate. Originally sodium sulfate was a by-product of the manufacture of hydrochloric acid by treating salt with sulfuric acid. As the demand developed for sodium sulfate, this material could no longer be considered merely a by-product and when shortages of salt cake threatened, a synthetic salt cake was actually made by fusing soda ash and sulfur.

In the wood pulp industry there are therefore two competitive pulping processes and in each the active pulping agent is a sulfur compound. Sulfur in the form of sulfur dioxide is also used as a bleaching agent, while in the form of alum and certain pigments it imparts special properties to paper. It thus is evident that sulfur as an element plays an important role in the pulp and paper industry.

Chemicals and Plastics

Any complete discussion of the effect developments in the chemical industry have had on the consumption of sulfur and sulfuric acid might, because of their close interrelation serve as a comprehensive chapter in the history of American industry as a whole. A discussion of certain isolated cases, however, will illustrate changes that have taken place in this industry.

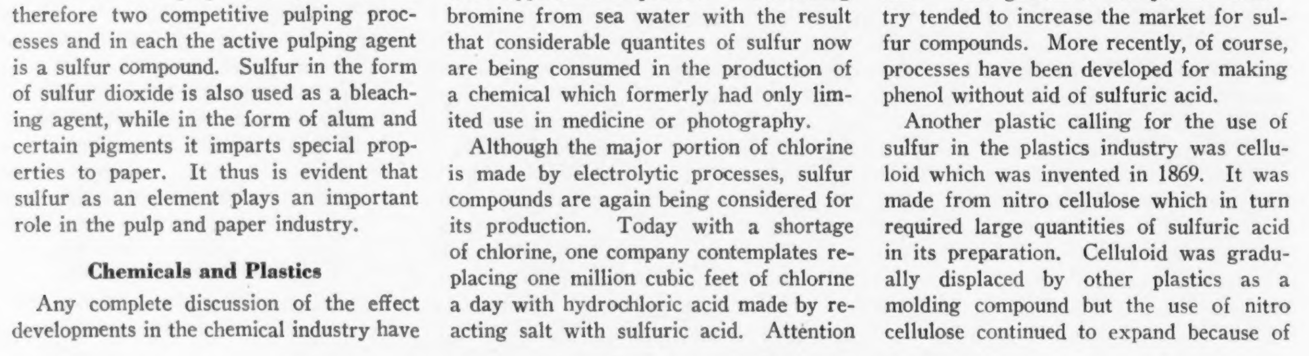
Initially the production of chlorine and bromine involved the use of sulfuric acid, although, as mentioned, chlorine was subsequently made by an electrolytic process. Bromine, ever since 1832 had continued to be made with sulfuric acid, but the demand declined shortly after 1870 because of the development of a new process of making photographs. Then a new demand for bromine appeared in an unsuspected quarter. The petroleum industry, due to changes in methods of making gasolene, and to advances in engine design, began to call for increasing quantities of bromine to be used in connection with lead tetra ethyl. Sulfuric acid and sulfur dioxide were applied in a process of recovering bromine from sea water with the result that considerable quantites of sulfur now are being consumed in the production of a chemical which formerly had only limited use in medicine or photography.

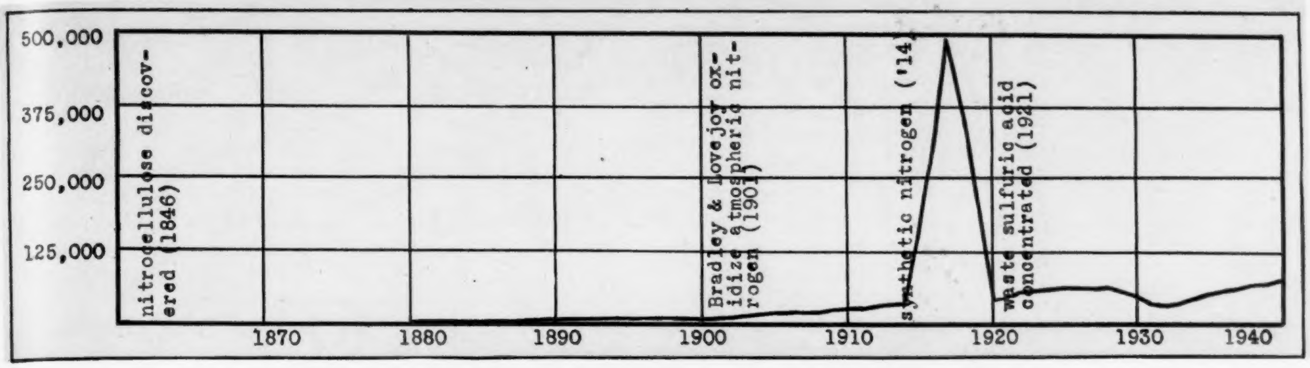
Although the major portion of chlorine is made by electrolytic processes, sulfur compounds are again being considered for its production. Today with a shortage of chlorine, one company contemplates replacing one million cubic feet of chlorine a day with hydrochloric acid made by reacting salt with sulfuric acid. Attention has also been given a process of making chlorine by reacting salt with sulfur trioxide. Certainly it should be interesting to watch whether sulfur compounds in the future will again take part in the production of chlorine.

Sulfur has also played an interesting role in the development of the plastics industry. Charles Goodyear in 1839 first used sulfur to vulcanize rubber and furnish a product which contributed much to the development of the automobile industry. Then it was discovered that when large quantities of sulfur were combined with rubber, ebonite was produced. This material is still serving as a molding compound, although in 1908, the invention of Bakelite partially replaced hard rubber. Even this, however, did not force sulfur out of plastics industry for in the production of Bakelite, phenol was required. And, since insufficient supplies of phenol were available, this chemical was synthesized from benzene with aid of sulfuric acid. Thus growth of the plastics industry tended to increase the market for sulfur compounds. More recently, of course, processes have been developed for making phenol without aid of sulfuric acid.

Another plastic calling for the use of sulfur in the plastics industry was celluloid which was invented in 1869. It was made from nitro cellulose which in turn required large quantities of sulfuric acid in its preparation. Celluloid was gradually displaced by other plastics as a molding compound but the use of nitro cellulose continued to expand because of

Sulfur consumed by chemical industry. All forms (sulfur, pyrites, smelter gas). In equivalent 1,000 tons. 3-year averages, centered.





Sulfur consumed by explosives industry. All forms (sulfur, pyrites, smelter gas). In equivalent 1,000 tons. 3-year averages, centered.

the development of transparent photographic films in 1888. Cellulose acetate partially displaced cellulose nitrate in the manufacture of films, but then increasing quantities of the latter were used in the production of nitro cellulose lacquers for automobiles.

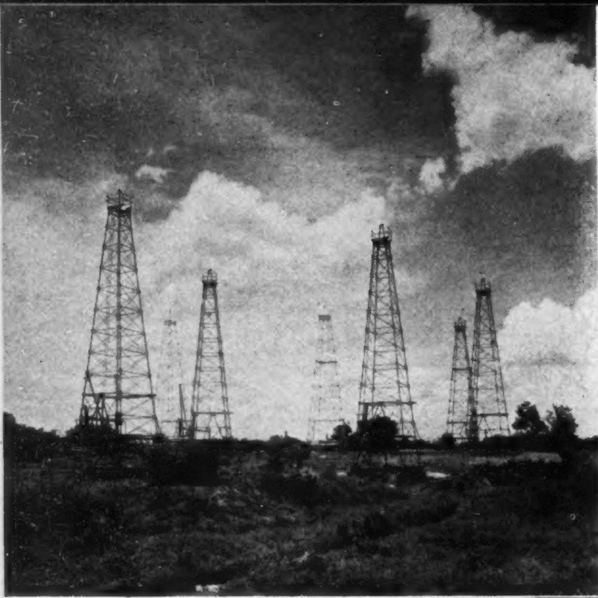
The shift from material to material continues and usually you find that versatile element sulfur accommodating itself to the change. This is clearly indicated in the changes which have taken place in the rubber industry. Soon after rubber became of industrial importance research was instituted to find substitutes. A rubber-like material called factice was made by treating certain oils with sulfur chloride. Thiokol, a rubber-like material containing as much as 80 per cent of sulfur was placed on the market soon after 1928. Then a host of other synthetic rubber-like materials were being placed in production. It is interesting to note that sulfuric acid is used in the manufacture of practically all of them and that sulfur is required in their vulcanization.

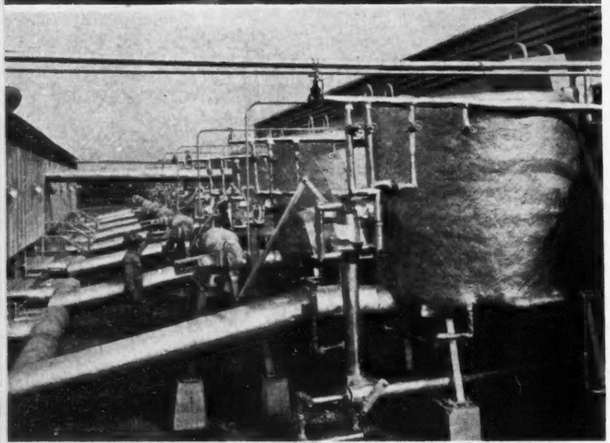
These isolated examples, dealing with halogens, plastics and rubber are illustrative of the changes which occur in the chemical industry and of the manner in which sulfur seems to adjust itself to these changes. No doubt in a discussion of the chemical industry it might also be interesting to develop the part that sulfur (sulfuric acid) has played in the growth of the synthetic organic chemicals industry—how, for example, the synthesis of indigo developed a demand for concentrated sulfuric acid. Or to discuss the growing pigment industry which consumes increasing quantities of acid. It is hoped, however, that the cases which have been discussed will serve to illustrate the vital role that sulfur plays in the chemical industry.

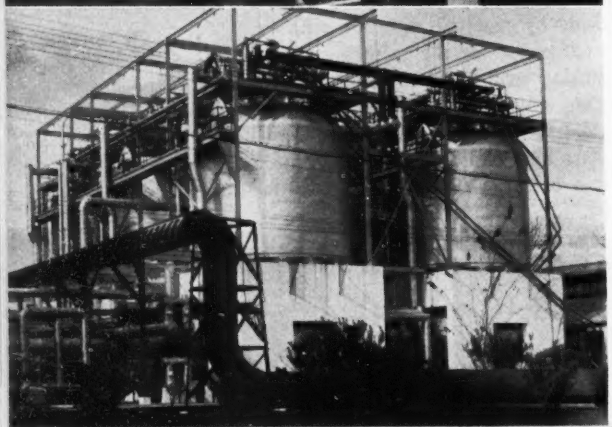
The Explosives Industry

Our first explosive was gun powder which in current practise consists of a mixture of 75 parts saltpeter, 13 parts charcoal, and 12 parts sulfur. In 1846 Schonbein made "guncotton" by treating cotton with a mixture of strong nitric and sulfuric acid. This discovery in the hands of other researchers led to the development of smokeless powder, gelatin dynamite, blasting gelatin, T.N.T. and picric acid, all of which are nitrated organic materials. All of them contain nitrogen which was made to combine with the organic body by reaction with nitric acid in the presence of strong sulfuric acid. The nitric acid, of course, is consumed in the reaction but the sulfuric acid only facilitates the reaction and may be recovered in a diluted form. But since the nitric acid which is consumed was made by reacting saltpeter with sulfuric acid, and since the sulfuric acid used in making such nitric acid was converted to nitre cake and, therefore, was not available for recovery, the development of these high explosives led to the consumption of large quantities of sulfuric acid.

First operation of Texas Gulf at Gulf, Texas, about 1920. Note contrast in volume of the sulfur storage vat and the proximity of drilling rigs above sulfur wells to the pile. In modern operations the wells are several miles from the vats.







Attempts had been made to produce nitric acid by other means. In 1901 Bradley and Lovejoy, at Niagara Falls, converted atmospheric nitrogen to nitrates by an electric process. Later the American Cyanamid Company installed a plant to fix nitrogen by passing it over calcium carbide to yield cyanamid. The cyanamide could be converted to ammonia which in turn could be oxidized to nitric acid. A start was made to produce nitric acid by some such means during the last war, but Chile saltpeter and sulfuric acid were the only sources of nitric acid in the United States. As a result of our dependence on Chilean saltpeter for nitric acid, 1.6 lb. of 100 per cent sulfuric acid was consumed in the production of 1 lb. nitroglycerine; 2.3 lb. for manufacturing 1 lb. smokeless powder from cotton linter; 2.2 lb. for manufacturing 1 lb. T.N.T. from toluol; and 6.5 lb. for manufacturing 1 lb. picric acid from benzol. It has also been estimated that during the period June to August, 1918, 36 per cent of all sulfuric acid made was consumed in the manufacture of explosives.

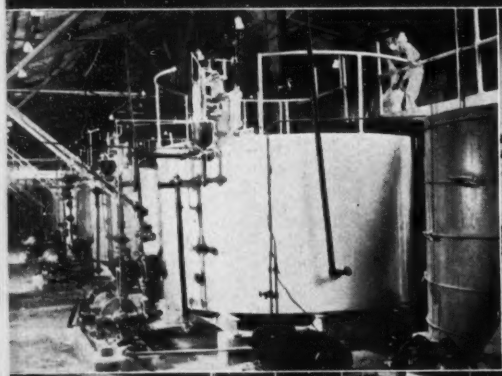
Immediately after the World War, plants were installed for makng synthetic ammonia by a process which had been developed by Nernst and Haber during 1905-1914. By 1932 the capacity of these plants was said to be 300,000 net tons of nitrogen a year. It is indeed fortunate that today, although there again is a shortage of ammonia, that this country does not find itself dependent on foreign sources for the raw materials for nitric acid.

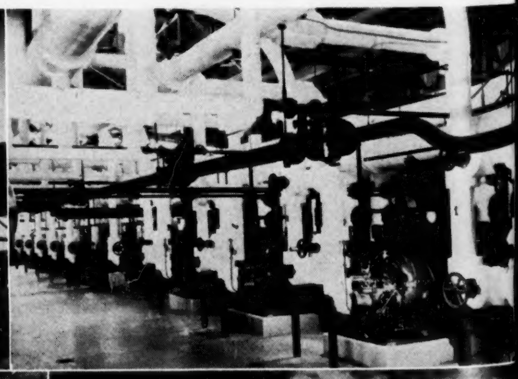
As a result of these changes the functon of sulfuric acid in the manufacture of high explosives today is restricted to that of dehydrating agent. Although it still is essential to the manufacture of T.N.T. and other high explosives, it usually is recovered in a diluted form that can be concentrated and reused. As a result, with the demand for explosives greater than ever, it is fortunate that 1 lb. of smokeless powder can now be made with 0.2 lb. of sulfur and 1 lb. of T.N.T. with 0.035 lb. sulfur. This is extremely important to National Defense. If explosive manufacturing today required sulfuric acid at the 1914-1918 rate, there would be insufficient sulfuric acid plant capacity to satisfy the needs. The explosives industry in this case seems to have accommodated itself to the resources of the Nation.

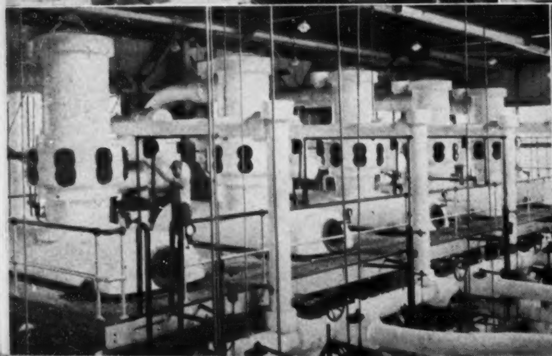
Summary

The element sulfur is indeed very closely related to the development of not only the chemical but all American industry. It helped to initiate the fertilizer industry, the sulfite pulp, the sulfate pulp, the explosives and the rubber industries. It has participated in the development of many new products including rayon, cellophane, synthetic rubber, pigments, celluloid, and tin cans. Being versatile and being available in a variety of forms, it accommodates itself to shifts in industry. It may be supplanted in a given manufacturing process, but it is almost a certainty that sooner or later it will again appear in the same industry and possibly assume an even more important role. Even such a brief revew of the influence of sulfur on American Industry accentuates the part American ingenuity has played in that development.

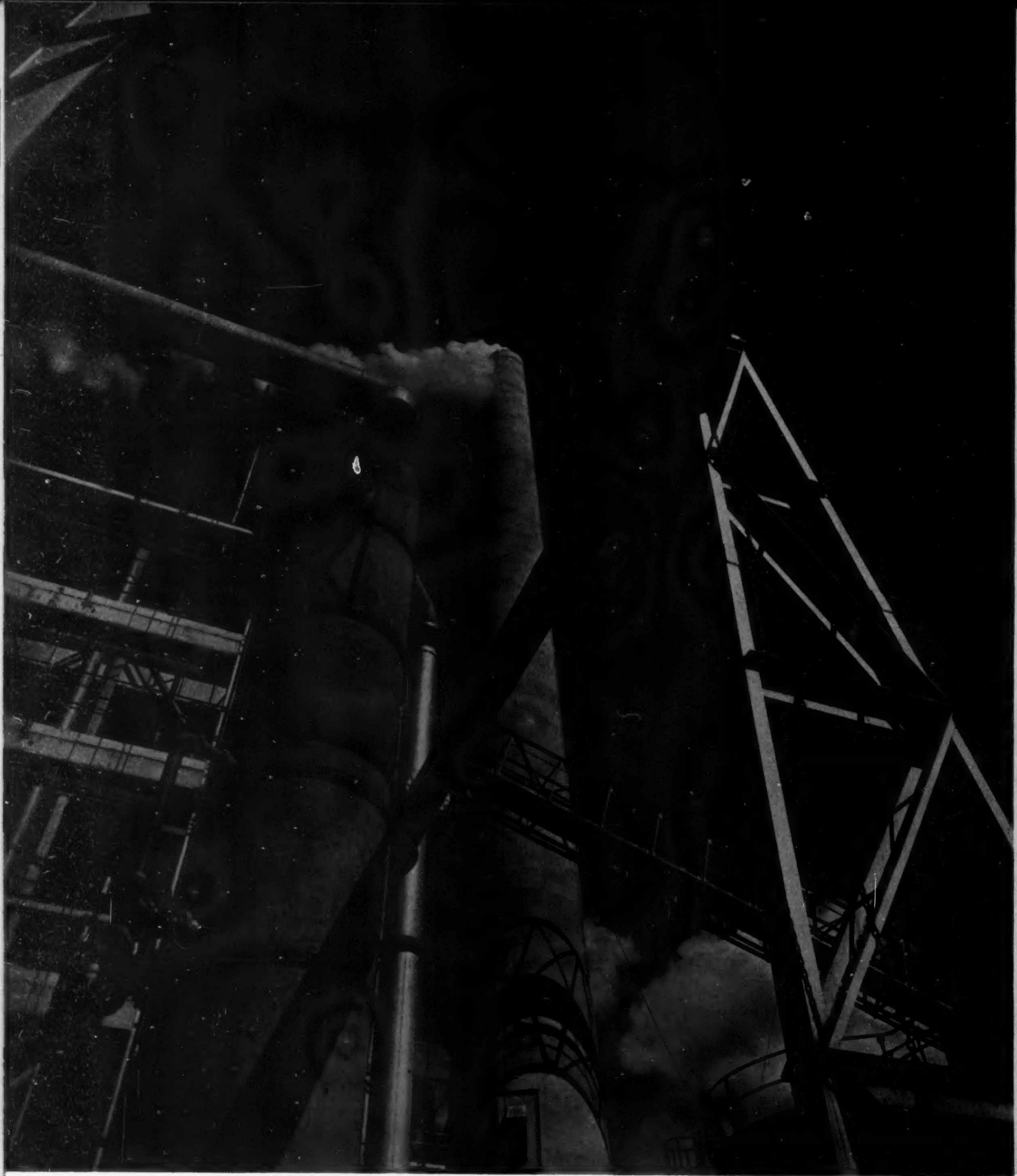
Read top to bottom for vertical pictures; then left to right for bottom ones: ¶ Sulfur wells in operation today. ¶ Sulfur metering tanks which gauge production. ¶ Water softening plant. ¶ Inside view of water softening plant. ¶ Bleedwater treating plant. ¶ Pumps for driving hot water into field and wells. ¶ Mine water heaters pumped by motors shown above, right. ¶ Control panel in minewater heating plant. ¶ Trainload of sulfur leaving for commerce and industry.








CURIOUS CHEMICAL ODDITIES
OUR INDUSTRIAL CHEMICAL MANUFACTURERS CONSUME MORE THAN 1/2 OF ALL THE SALT PRODUCED IN THE U.S.A.!
THE VERSATILE BENJAMIN FRANKLIN INVENTED PLASTER OF PARIS FOR FERTILIZING.
2 QUARTS OF WATER AND 2 QUARTS OF ALCOHOL MAKE 3 4/5 QUARTS MIXED!
3.8 QTS.
2 QUARTS OF WATER
2 QUARTS OF ALCOHOL
3 4/5 QUARTS MIXED
WHEN YOU MIX ETHYL ALCOHOL WITH WATER A CONTRACTION OF VOLUME TAKES PLACE, DUE TO A DIMINUTION OF MOLECULAR INTERSTICES OF THE 2 SUBSTANCES IN THE CHEMICAL COMBINATION.
PETRIFYING WATERFALL!
-ETEUF, FRANCE-
ANYTHING THROWN IN IT TURNS TO STONE! WOOD, LEATHER, CLOTH, ETC., BECOME AS HARD AS STONE WHEN SATURATED WITH THE. CHEMICAL ELEMENTS IN THE WATER!
THE DEGAUSSING CABLES, USED TO PROTECT SHIPS FROM MAGNETIC MINES ARE INSULATED WITH PLASTICS DERIVED FROM CHLORINE!
H.T. ELMO



A SAGA OF SALT

This is a story of The Mathieson Alkali Works, a pillar of chemical society. Timely and complete, it typifies 50 years of progress in chemical manufacture.

Above, an interesting feature of Mathieson's Lake Charles plant is the open construction of several of the processing buildings, made possible by the mild weather in this locality.

Left, Thomas T. Mathieson.

FIFTY years ago, Thomas T. Mathieson, the son of a retired chemical manufacturer of Cheshire, England, accepted a proposal from a group of American business men who had for many years been importing soda ash, bleaching powder and other chemicals made by his father's firm, The Neil

Mathieson Company. Getting together about fifty of his father's former workmen, Mr. Mathieson brought them to Saltville, Virginia.

Saltville lies in the Great Valley, which runs from Alabama through the extreme western part of Virginia and into Pennsylvania. This valley is the most fertile and, in the opinion of many, the most beautiful in the world. Throughout its length it is a garden, for here alone can eastern soil grow more corn and wheat per acre than the prairie lands of the west.

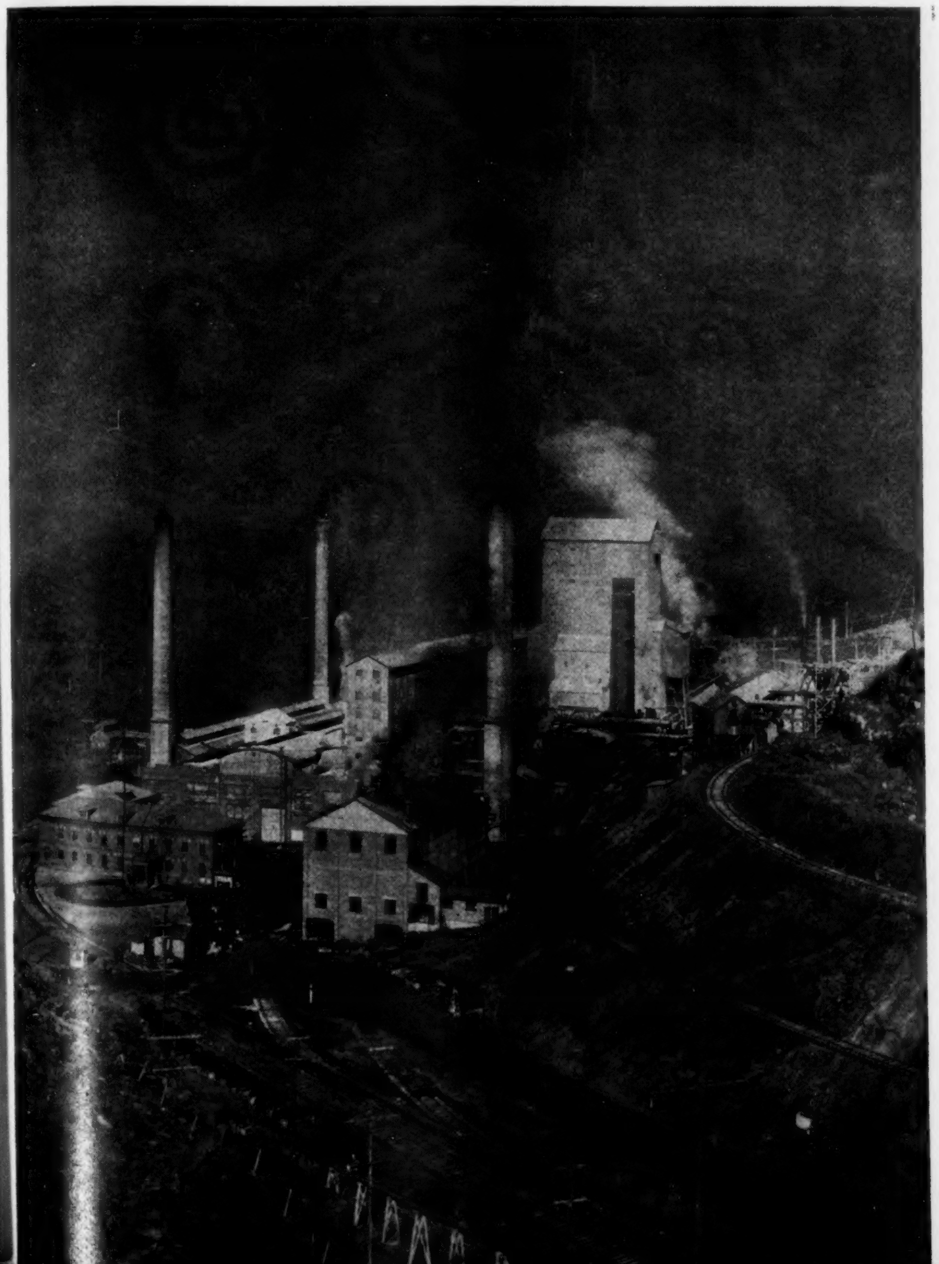
For good measure, Nature gave that portion of the Great Valley in which Saltville is located still further wealth in the form of rock salt, deposited in beds having an area of more than 500 acres and a thickness of 175 feet. The salt beds lie two hundred feet below the surface, but their presence is revealed by salt springs.

Before white men invaded their continent, buffalo, deer, and other animals visited this "salt lick," and here, too, came Indians to obtain salt by boiling down the salt water. White settlers came here as soon as it was safe to do so, and, since the Saltville deposits were the only source of "fossil salt" known in America until 1862, they quickly became commercially important.

Their importance increased with the outbreak of the Civil War because, in those days, salt was as essential for military operations as oil is today. To fight, soldiers must have meat, and, at that time, the only known way of preserving meat for the use of armies was to salt it. As Saltville provided the Confederacy with its sole supply of this preservative, the destruction of its salt works was always a Union objective.

But Saltville was well guarded until the last year of the war when Southern manpower began to dwindle. Union troops were finally able to break through its defenses, burning buildings, destroying evaporating pans, and filling the salt wells with cannon balls. As saboteurs, however, they were inefficient; the production of salt was resumed a few weeks after the raiders withdrew.

Mathieson's plant at Saltville, Va., which began operations July 4, 1895, was the first alkali plant built in this country below the Mason and Dixon line.



Production of Ash at Saltville

Like many before him, Mr. Mathieson was drawn to Saltville by its salt. However, he was not interested in it as such, but as a raw material for the production of soda ash, or anhydrous sodium carbonate, which is needed for the manufacture of glass, soap, paper, and many other important products. On his arrival at Saltville, he found the foundations of a soda ash plant already laid; it was his business to supervise the erection of the buildings and to equip them with the necessary machinery.

Little soda ash was being made in the United States at this time, and the need had long existed of a source of supply located south of the Mason-and-Dixon line, where no plant had yet been built. Neil Mathieson having consented to come over and erect a plant, a company was formed which received its charter in 1892 and was called The Mathieson Alkali Works. This name and Mathieson's "Eagle Thistle" trade-mark were adopted because both were favorably known to chemical users all over the country, and the American company proposed to turn out the same high-grade product that had won this reputation.

The site selected for the new plant was ideal for the purpose. In addition to salt, the basic requirements for the manufacture of soda ash are lime and fuel. Both are available at Saltville in abundance, for the entire Great Valley is cut out of limestone, and just beyond its western wall lie the coal fields of Virginia, West Virginia, and Kentucky.

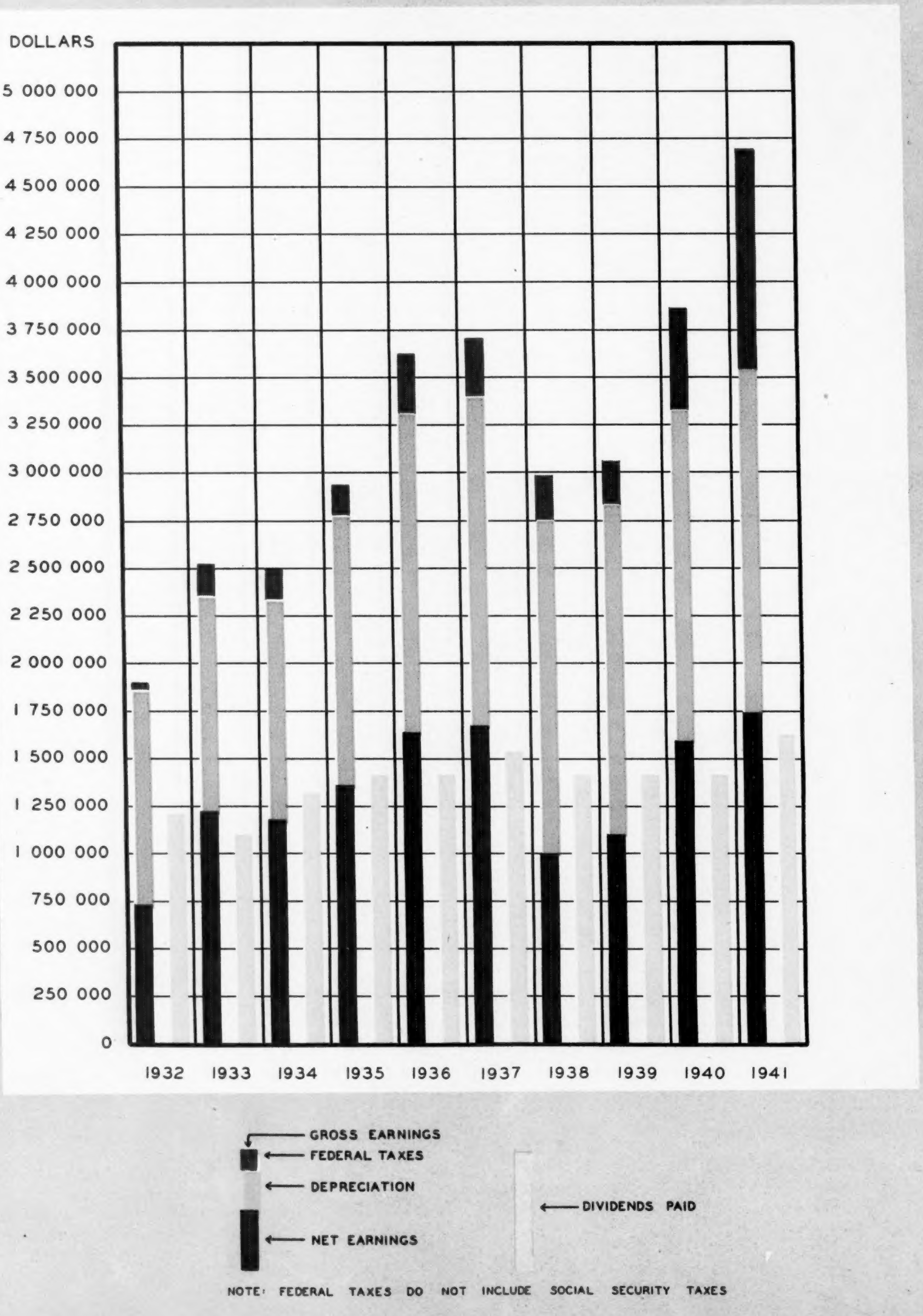
As matters turned out, the elder Mathieson did not come to America but sent an acceptable substitute in the person of his son. Under the latter's supervision and with the help of his trained workmen, the Saltville plant was brought to completion and began producing soda ash on July 4, 1895.

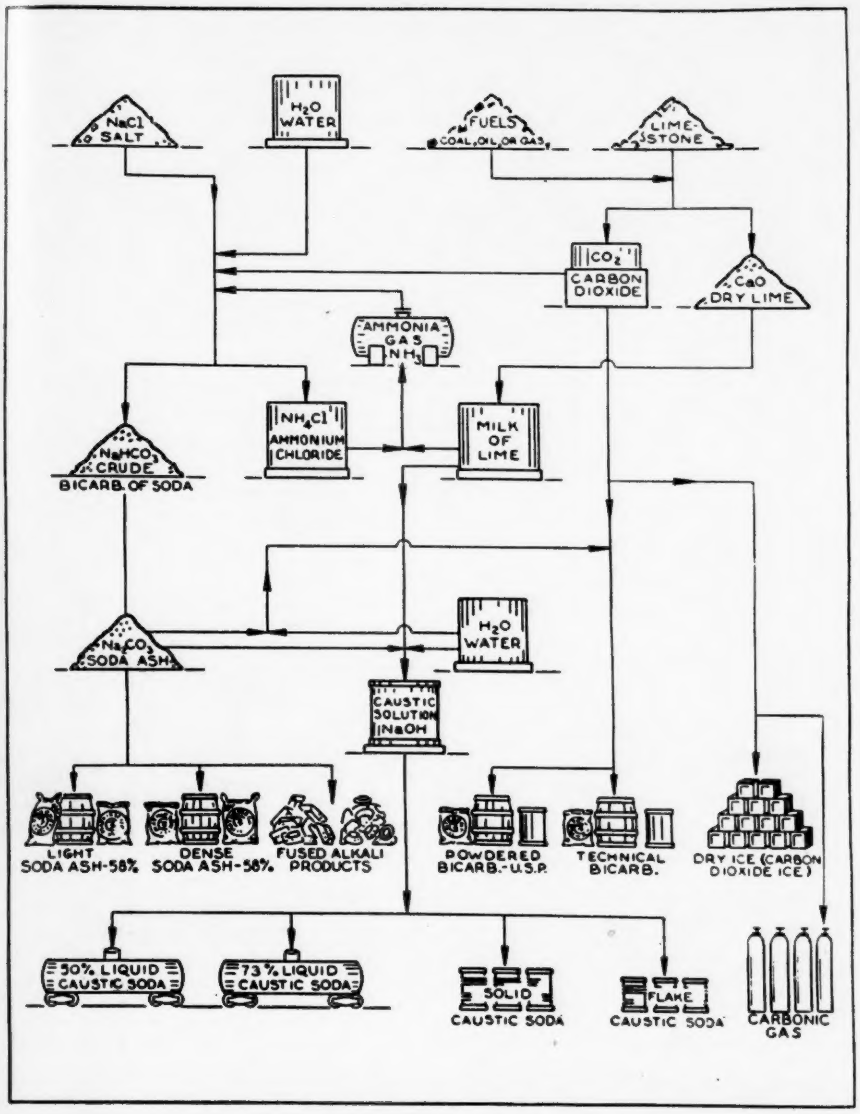
After starting operations, Thomas Mathieson kept in touch with the project for about a year and then severed his connections with the company, living in England until his death in 1921.

Mathieson did an excellent job at Saltville, but, as the American management soon discovered on taking over control, his methods involved production costs too high to meet our competitive conditions. Every single operation in the plant—and many of them were arduous and disagreeable—had to be done by human muscles.

There was no remedy except to redesign and rebuild the entire plant in accordance with American ideas. It took several

-10 YEAR COMPARATIVE REVIEW





Flow Chart of Ammonia Soda Operations

Principal raw materials in process are salt, lime and fuel. At both Saltville and Lake Charles, salt is obtained from company-owned wells and the brine is brought into the plant by pipe line. At Saltville, source of lime is limestone from company-owned quarries while at Lake Charles oyster shells, present in abundance, are used. Saltville plant uses coal for fuel while Lake Charles uses natural gas. At Lake Charles in addition to caustic soda and soda ash, synthetic salt cake, a sintered mixture of soda ash and sulfur for use in the production of Kraft paper pulp, is also produced in large commercial quantities.

years to finish this immense task, but it was done without interrupting production. On its completion, the Saltville plant was the most modern and efficient in the country. Continuous improvement has kept it up to date, and it is today outstanding in the field of chemical engineering.

The Ammonia-Soda Process

The ammonia-soda process for making soda ash, employed at Saltville, is based on the fact that when ammonium bicarbonate is added to a saturated solution of sodium chloride, crystals of sodium bicarbonate are precipitated and ammonium chloride goes into solution. On filtering out the sodium bicarbonate and calcining it, anhydrous sodium carbonate (Na_2CO_3), or soda ash, is formed.

In practice, the process is carried out in a series of steps, so devised that only cheap materials are consumed and the ammonia is almost completely recovered. These steps are, briefly, as follows:

1. Salt is obtained from the salt wells in the form of brine, which is piped to the plant.

2. Limestone is quarried and sent by aerial tramway to the kilns, where it is calcined, forming carbon dioxide gas and lime. As will be seen, both of these products have several different uses.

3. The brine, after being purified to remove calcium, magnesium and other impurities, is passed into large absorbers where ammonia gas from a distillation operation is absorbed in it.

4. The ammoniated brine is then processed in precipitating towers with CO_2 gas from the lime kilns. As the ammoniated brine passes down through the towers, the following reactions take place in succession:

(1) $NaCl + 2NH_3 + CO_2 + H_2O \rightarrow (NH_4)_2CO_3 + NaCl$

(2) $(NH_4)_2CO_3 + CO_2 + H_2O + NaCl \rightarrow 2NH_4HCO_3 + NaCl$

(3) $NH_4HCO_3 + NaCl \rightarrow NaHCO_3 + H_2O + CO_2$

These reactions may be summed up as follows:

$$NaCl + H_2O + NH_3 + CO_2 \rightleftarrows NaHCO_3 + NH_4Cl$$

5. Calcining the sodium bicarbonate forms soda ash, as follows:

$$2NaHCO_3 + heat \rightarrow Na_2CO_3 + H_2O + CO_2$$

The carbon dioxide thus obtained is used in the manufacturing process.

Recovering the Ammonia—The ammonium chloride obtained in Step No. 4 is treated with milk of lime and steam. Ammonia gas is evolved and calcium chloride is left as a by-product.

$$2NH_4Cl + Ca(OH)_2 = 2NH_3 + 2H_2O + CaCl_2$$

Products of the Process

The products made at Saltville by virtue of this process include the following:

Soda Ash—The soda ash produced at Saltville is 99.3 per cent pure sodium carbonate and contains over 58 per cent of sodium oxide (Na_2O). Hence, it is called 58 per cent soda ash. It is produced in two grades, light and dense. The dense grade has a specific gravity that is about double that of the light ash. Both grades have their special applications, the light grade, for example, being preferred for soap making and the dense grade for glass manufacture.

Caustic Soda—Caustic soda is made from soda ash at Saltville by treating it in solution with milk of lime.

$$Na_2CO_3 + Ca(OH)_2 = 2NaOH + CaCO_3$$

In the early days, the product made by this process contained more impurities than Castner electrolytic caustic, but unremitting research by Mathieson introduced refinements that eventually eliminated this difference. In fact, certain especially undesirable impurities are removed so completely from Saltville caustic that their presence in amounts greater than 1/100,000 of one per cent can not be detected by spectrographic analysis.

Making liquid caustic available commercially is one of Mathieson's developments. Previously, all caustic was sold in solid form, which means that the producer has to evaporate the original weak solution to dryness and pack it in non-returnable drums, while the user has to handle and unpack the drums, redissolve the product, and, of course, pay all the extra costs involved.

Mathieson pioneered in the shipping of liquid caustic soda in tank cars and thereby enabled large users to secure caustic at a lower price and reduce their handling costs. Liquid caustic is shipped from all three Mathieson plants as both 50 per cent and 73 per cent liquid. In order to maintain this high purity until delivered into the hands of the buyer, Mathieson has developed special lined tank cars and also the special tanker "Nickeliner," in which the liquid caustic is carried in nickel-lined holds.

Bicarbonate of Soda—Bicarbonate of soda is made by recarbonating the purified carbonate, the bicarbonate formed at Step No. 5 of the manufacturing process being too impure to be used as the base material.

$$Na_2CO_3 + CO_2 + H_2O = 2NaHCO_3$$

Fused Alkali Products—For use in the foundry, pure soda ash is fused at a temperature of over 2000° F. and cast into pigs, thus supplying this material in a concentrated, moisture-free form, called Purite, that is convenient and economical to handle. A somewhat similar product is PH-Plus, which consists of fused alkali cast into slow-dissolving ½-lb. briquets especially for the pH control of swimming-pool water and other industrial water supplies.

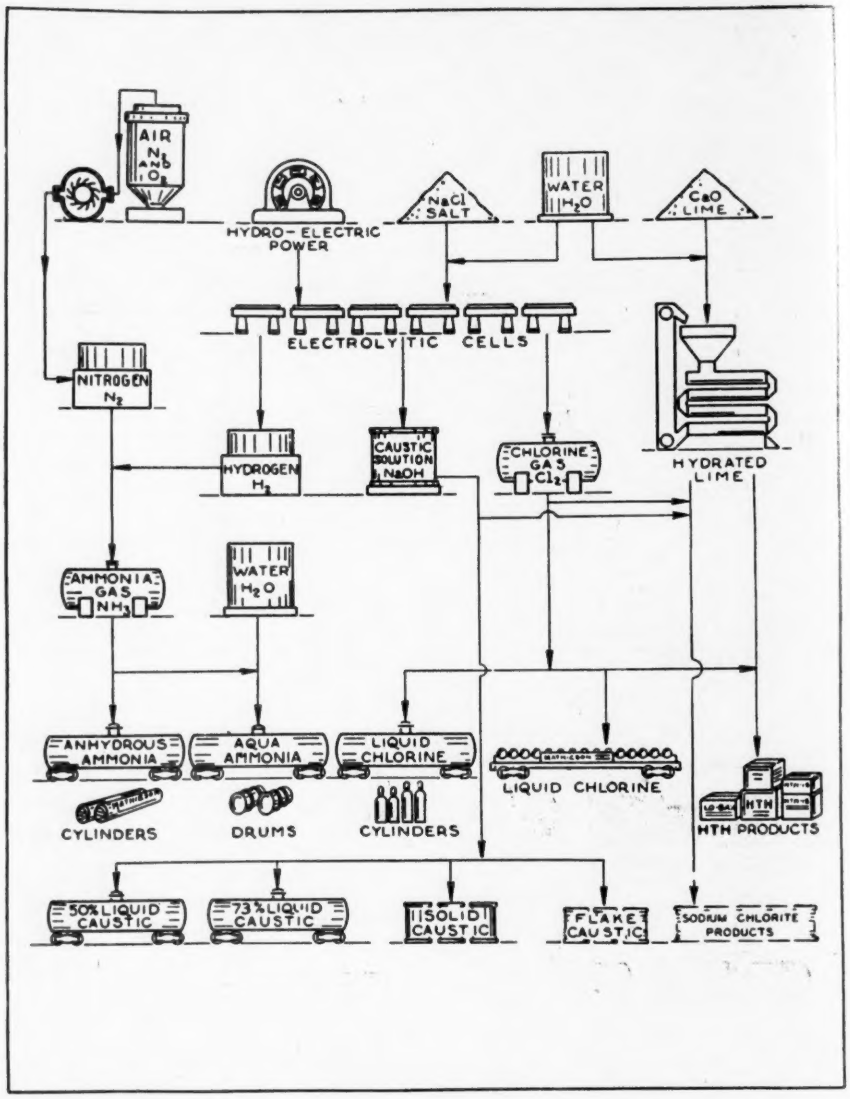
Two other alkaline products in briquet form are MaFoS, a detergent for use in dishwashing machines, and NuFoS, a similar product but supplied in larger briquets for cleaning milk cans. As both contain ingredients that would volatilize or be altered by high temperatures, a special method of forming the briquets by means of a low temperature process was developed.

Carbon Dioxide—Carbon dioxide, one of the by-products of the ammonia-soda process, is made available commercially as a compressed gas in steel cylinders and as a solid, which is better known as dry ice.

Both are used for supplying the gas for carbonating beverages, for use in fire extinguishers, and many industrial purposes; the solid form, which has a temperature of 109° below zero F., is widely used as a refrigerant by ice cream manufacturers and shippers of other food products.

Solid carbon dioxide is made by liquifying the purified gas under pressure at low temperatures and then allowing it to expand, thus cooling it to a much lower point at which much of it solidifies. The "snow" thus produced is formed by pressure in hard, dense cubes, weighing 55 lbs. each.

A specially-designed, insulated railroad car was developed by Mathieson to transport solid carbon dioxide from the plant to the various distributing points throughout the South, where the product is marketed.



Flow Chart of Electrolytic Operations

Just as in ammonia-soda process, chief raw material here is salt. Here, however, brine is decomposed by an electric current into its elements. Sodium reacts with water to form a caustic soda solution, at the same time forming hydrogen gas, while the chlorine gas passes off at the other end of the electrolytic cell. Hydrogen is purified and mixed with purified nitrogen gas from the atmosphere, then the two gases are combined to form ammonia.

The Castner Electrolytic Process for Making Caustic

While the Saltville plant was still under construction, the Mathieson organization became interested in the Castner process for making caustic direct from salt by electrolysis and secured the United States patent rights on December 1, 1894.

The inventor of this process, Hamilton Y. Castner, was a chemical genius. He was the first to produce metallic aluminum commercially, using sodium to extract it from its ores; he saved his aluminum company from ruin by creating a demand for metallic sodium when Hall introduced his electrolytic-aluminum process; he originated the process of graphitizing carbon, which was later developed by Acheson; and he has several other important chemical inventions to his credit.

His electrolytic-caustic process was an ingenious solution of a problem that had, until then, been considered unsolvable.

Several processes for the commercial production of caustic by electrolyzing a salt solution were in use at that time, all being based on the fact that when an electric current is passed through a salt solution, chlorine appears as a free gas at the anode and sodium travels to the cathode where it reacts with water, forming caustic and hydrogen.

$$NaCl + \text{electricity} = Na + Cl$$
$$Na + H_2O = NaOH + H$$

In all of these processes, the product obtained by electrolyzing a saturated solution of salt, which contains about 25 per cent of NaCl, was a solution containing about 12 per cent of NaOH and 12 per cent of NaCl. The next step was to evaporate the solution, allowing the salt to crystallize, and remove as much of it as possible.

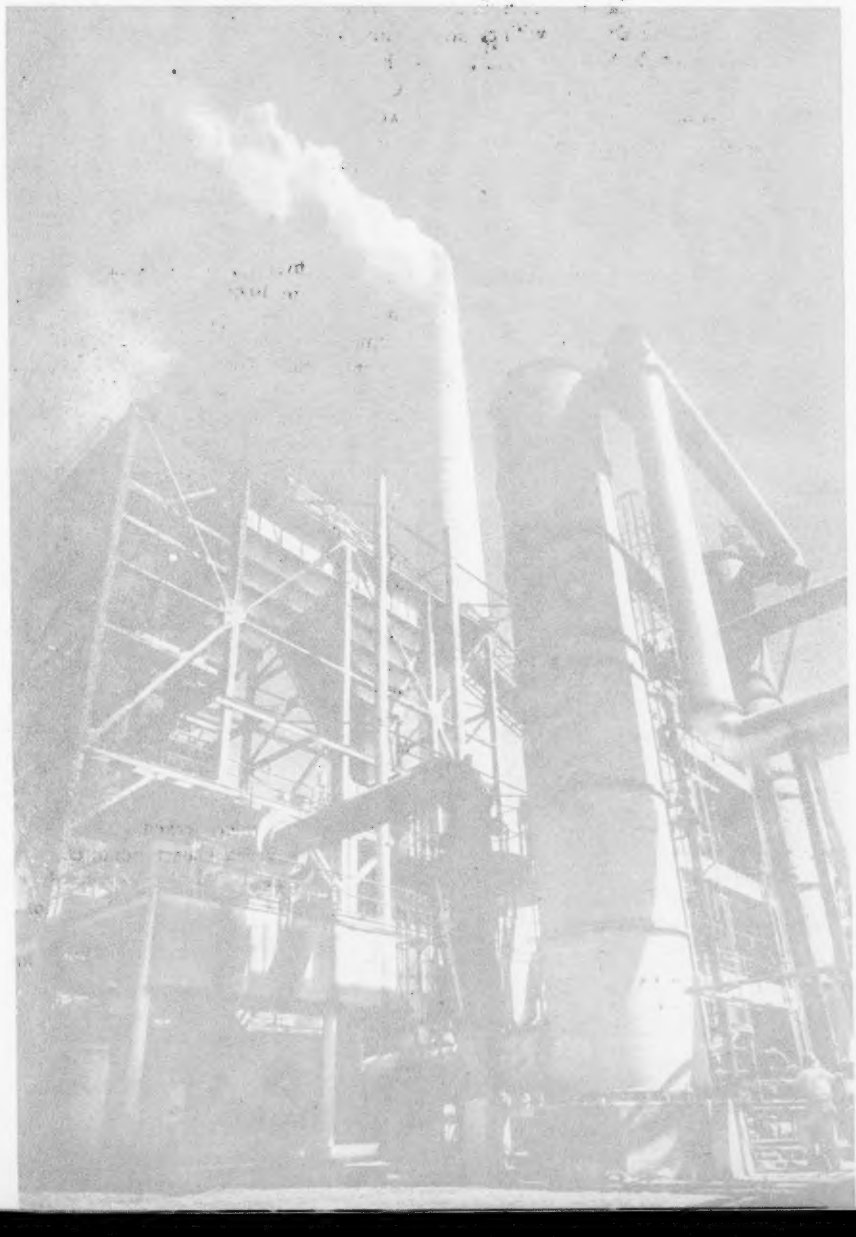
Castner, however, invented an electrolytic cell that was capable of producing a solution containing about 20 per cent of NaOH and less than 0.2 per cent of NaCl.

The Castner Cell—This cell consists of a rectangular tray, 5½ feet long, 3¼ feet wide, and 4 inches deep, which is divided crosswise by partitions into a large central and two somewhat smaller end compartments. The partitions make tight joints with the sides of the cell but fit into oversized grooves in the bottom.

The openings thus left under the partitions are sealed by a layer of mercury which covers the bottom of the cell. By means of a mechanical device, one end of the cell is raised and lowered about half an inch every minute; this rocking motion causes the mercury to circulate freely from compartment to compartment, but without breaking the seals.

The end compartments are filled with saturated brine and are equipped with graphite anodes. The central compartment, which is filled with pure water having enough added caustic to make it conducting, contains an iron grid mounted above the surface of the mercury. Mercury and grid are electrically interconnected by means of a circuit so designed that 90 per cent of the current flows out of the cell through the grid and about 10 per cent out directly from the mercury.

In the foreground (above) is the building housing dryers in which crude sodium bicarbonate is converted into sodium carbonate at Lake Charles.



Below, view of feed-in end of kilns for calcining oyster shells at Lake Charles, together with apparatus for scrubbing the CO_2 before used in production of sodium bicarbonate.

The path of the main current through the cell is as follows: Entering at the anodes in the end compartments, it passes through the brine to the mercury, which here acts as a cathode; it then flows through the mercury into the central chamber, where the mercury now acts as an anode, and, traveling through the liquid, leaves the cell by way of the iron grid.

When the current is turned on, the brine in the end compartments is decomposed. The chlorine is collected at the anodes by suitable means, and the sodium goes to the mercury, which dissolves it. Since the mercury is being constantly circulated by the rocking motion of the cell, it carries the sodium into the central chamber. Here, electrical conditions are such that the sodium leaves the mercury, passes into the water, and reacts with it to form caustic, which remains in the water, and hydrogen, which is also collected.

In operation, the process is continuous. Brine, automatically kept at the desired strength by the addition of fresh salt, is circulated through the end cells; caustic in solution is withdrawn from the central cell and is replaced by pure water. As

the mercury seals prevent the solutions from intermixing, the caustic produced is exceptionally pure.

In the fall of 1895, a battery of 54 crude Castner cells, supplied with electricity from an electric plant installed for that purpose, was put into experimental operation at the Saltville plant. Though the electric plant proved to be too small to run the cells at their rated capacity, they produced about a ton of caustic and 1800 lbs. of chlorine per day, the latter being used to make potassium chlorate.

By March, 1896, it was evident that the Castner process had proved its worth, but it was also evident that an abundant supply of cheap electricity was essential for its economical operation. Niagara Falls, where about 50,000 electrical horsepower was being developed, was, therefore, selected as the site for a new plant.

In the meantime, it was decided to continue operations at Saltville in order to gain experience and to train workers. So, additional electrical equipment was installed, and the cells were put to work again in the fall of 1896. This time the chlorine was used for making bleaching powder.

1897 Was Trouble Year

All went fairly well until January, 1897, and then real trouble started. The cells, which were made of slate or stone, scaled so badly that the mercury would not flow properly; slate partitions went to pieces; the ordinary carbon anodes, then being used, disintegrated; and the rubber piping that circulated the electrolytes developed leaks. Finally, when a whole line of cells exploded, the plant was shut down for a complete overhaul.

These and other operating troubles, it may be said, eventually defeated every other user of the Castner cell. But Mathieson, after solving innumerable problems created by the corrosiveness of the products, finally succeeded in developing a cell that was entirely satisfactory and is still using the Castner process exclusively for making electrolytic caustic.

A Mathieson subsidiary, the Castner Electrolytic Alkali Company, was created to operate the new plant at Niagara Falls. This company continued in existence until 1917, when it was merged with the Mathieson Alkali Works to form the present organization, The Mathieson Alkali Works, Incorporated.

The Niagara Falls plant was put into operation on Thanksgiving Day, 1897, and was the first electro-chemical enterprise to be established in this location. It contained 540 Castner cells, which had a capacity of ten tons of caustic per day. Since then, it has been rebuilt and greatly enlarged, but it has never ceased turning out caustic of the highest purity.

Controlling and utilizing the chlorine given off by the electrolysis of salt became major problems as soon as Mathieson adopted the Castner process.

Under the best of circumstances, working with chlorine is unpleasant, and this was particularly true in the days when modern gas masks and protective clothing were unknown. The mere detail of keeping themselves alive when on the job taxed the ingenuity of the chemists and engineers who undertook to deal with this lively element. All sorts of protective devices were tried out, with little success in most cases, and finally reliance was placed upon a helmet that covered the entire head and was supplied with air through a long hose.

The Mathieson men learned how to cope with their adversary and began a series of developments of outstanding importance in the bleaching, sanitation, and other fields.

Bleaching Powder

Bleaching Powder—The bleaching powder made during the experimental operation of the Castner cells at Saltville was the first to be produced in appreciable quantities in the United States, as only imported material was then available in this country.

Bleaching powder is made by spreading dry slaked lime on the floor of a chamber and then filling the chamber with chlorine. The resulting product is a mixture of calcium chloride, $CaCl_2$, and calcium hypochlorite, $Ca(ClO)_2$. Only the chlorine in the calcium hypochlorite, called "available chlorine," is active in bleaching; good, fresh bleaching powder should have an available chlorine content of about 37 per cent.

The bleaching powder produced at Saltville was not very good. It was made in chambers constructed of wood coated with pitch, and, as this construction was not tight enough to maintain the chlorine concentration needed to make high-test bleach, the best that could be turned out here was bleach having an available chlorine content of 32 per cent.

However, the experience gained at Saltville was applied to good purpose at Niagara Falls. Efficient bleach chambers made of lead were installed in this plant, and, when they were put into operation in 1897, the commercial production of bleaching powder in this country began.

Liquid Chlorine—Bleaching powder was invented in 1799, and very shortly thereafter became the only chemical bleaching agent in common use. It had its drawbacks, however. As soon as it is made, it begins losing its available chlorine, so its strength is an extremely variable quality. In addition, when mixed with water preparatory for use in bleaching, a heavy sludge of inactive calcium compounds is precipitated which must be removed before the solution is useable.

By 1900, Mathieson chemical engineers became interested in the possibilities of using pure chlorine for bleaching purposes. Several years of research followed, and, in April, 1909, liquid chlorine became one of the commercial products of the Niagara Falls plant.

The most difficult of all the many problems encountered in the course of this work was the compression of the gas. Every type of compressor said to be suitable for this operation, made here or abroad, was tried out, but all left much to be desired. One of these devices, which successfully produced the plant's first 50 lbs. of liquid chlorine, let the entire supply escape through a leaky valve.

Finally, Mathieson engineers devised a unique compression system of their own. In this system, concentrated sulfuric acid was forced by compressed air to the top of a tall tower. Here it passed a suction head through which chlorine gas was admitted, and, flowing down a long pipe, carried the chlorine gas along with it. At the bottom, acid and gas entered a compression chamber, where the gas separated out and was compressed by the weight of the sulfuric acid column. In addition, the acid dried the gas, which was an essential procedure. This contrivance was kept in use until after the first world war, when it was displaced by modern liquification equipment.

The problem of providing suitable containers for shipping and handling liquid chlorine also proved most troublesome. Cylinders of various capacities up to a ton were first developed, and then a special car that carried fifteen 1-ton containers was designed.

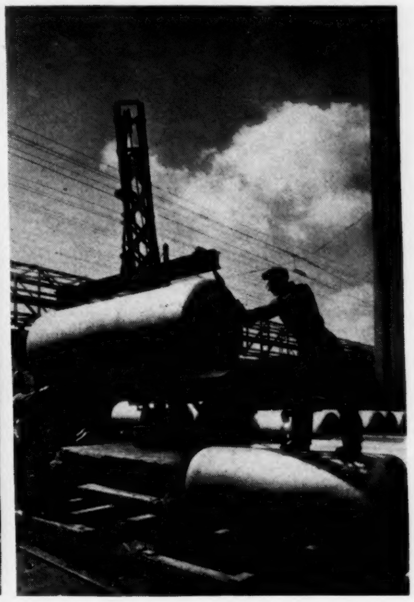
First Car in 1922

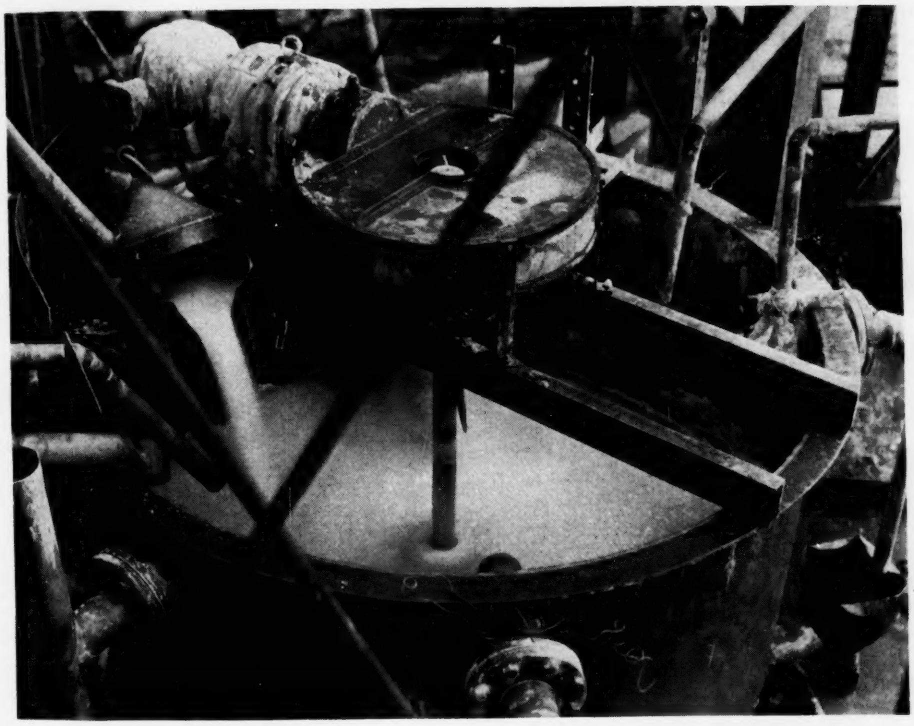
The first car of this type was put into service in 1922, but three years of argument before the Interstate Commerce Commission were required before it was accorded full Class V, or tank car, rating. When this was obtained, the use of the new car was made available to the entire industry. Today, shipments of liquid chlorine are made also in single-unit tank cars, having rated capacities of 16 and 30 tons net, and, of course, in the standard steel cylinders carrying 100 and 150 lbs. net.

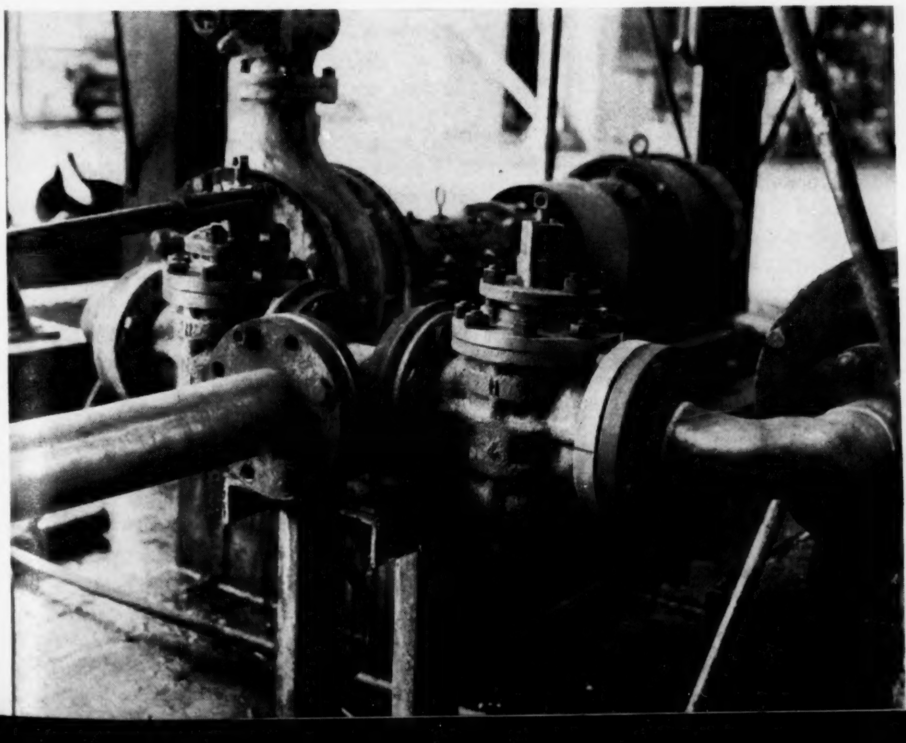
Calcium Hypochlorite—But liquid chlorine, too, has its drawbacks. Since it is a highly corrosive gas, destructive to lung tissue, it must be handled by trained workers and applied by means of special equipment. It is, therefore, unsuitable for use where the consumption is small or occasional.

Bleaching powder served these special needs for many years after liquid chlorine came into general use, but its disadvantages stimulated the company's technologists to develop something better.

They finally succeeded in working out a process for producing true calcium







hypochlorite in a readily-soluble stable form. This product was placed on the market as HTH, a germicide, bleach and chlorine carrier having an available chlorine content of 70 per cent.

Combined with certain alkalies that reduce its tendency to corrode metal equipment it is used, under the name of H-TH-N, as a poultry disinfectant and dairy bactericide, and for general sanitation around the farm. In another form, known as Lo-Bax and containing 50 per cent of available chlorine, it provides a concentrated, fast-killing bactericide for dairy plant and farm use.

Sodium Chlorite—Mathieson's latest chlorine compound is sodium chlorite, $NaClO_2$, called "chlorite" for short.

Until studied by Mathieson chemists, this product was a chemical curiosity and was never applied to any practical purpose. But the Mathieson workers discovered that it was not only a good bleaching agent but that it possessed a property that all other chlorine bleaching agents lacked —it was incapable of attacking cotton, wood, rayon, and other cellulosic fibers under any ordinary circumstances, whereas when these fibers are bleached white with other chlorine products their strength is always impaired.

Though chlorite was not made available in commercial quantities until 1941, it already has proven highly satisfactory in certain fields. It is being used by the textile industry under the name of Textone, and by the wood-pulp industry under the name of C2.

Synthetic Ammonia

One of the by-products of the decomposition of salt by the Castner process is hydrogen. For a long time, this gas was allowed to escape into the air, but since 1923 it has been combined with atmospheric nitrogen at the Niagara Falls plant to form especially pure anhydrous ammonia gas, NH_3, and aqua ammonia, NH_4OH.

This development was the result of the nitrogen starvation which was a grim reality in Germany, was feared by other nations during the first world war, and caused chemists everywhere to tackle the problem of "fixing" atmospheric nitrogen.

Mathieson workers started experimenting in this field in 1916 and soon produced a process for making cyanides, a nitrogen product, which was eventually taken over by the government. Later, they turned to the production of ammonia by passing a mixture of hydrogen and nitrogen through a heated catalyst, which causes the two to combine and form ammonia.

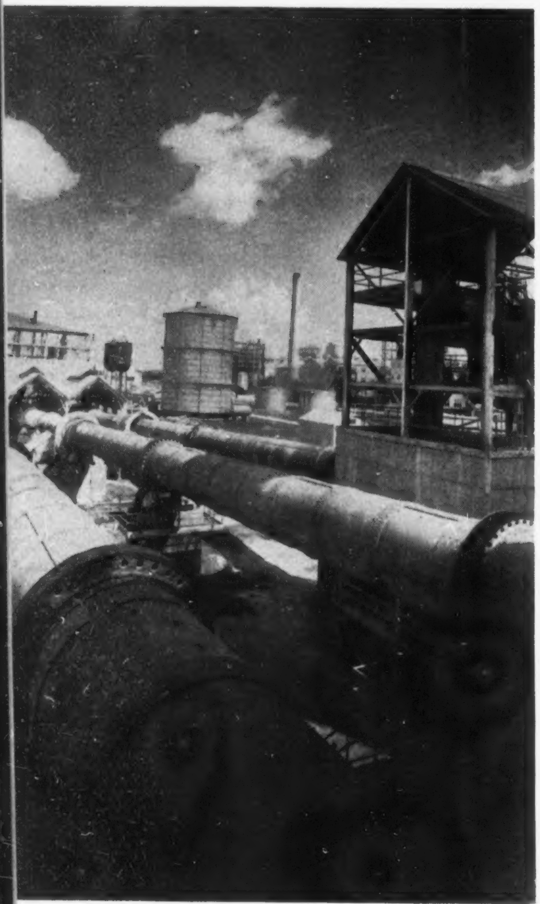
Top left, loading liquid chlorine into single-unit tank car. Top right, loading ton containers on multi-unit liquid chlorine tank car. Center, 50 per cent solution caustic receiving tank after evaporation. Bottom, nickel pumps and piping in caustic plant at Lake Charles.

Synthetic ammonia was first produced commercially in the United States at the Mathieson Niagara Falls plant in 1923.

The Lake Charles Plant

In 1935, Mathieson placed in production an ammonia-soda plant located at Lake Charles, Louisiana, 200 miles west of New Orleans, in order to serve the rapidly growing industries of the Mississippi Valley, the South, and the central Southwest.

This plant embodies all of the chemical engineering knowledge gained in a half century of experience. Here, handling costs are reduced to a minimum. Almost every process is performed automatically, with automatic control, so that relatively few men can take care of an immense output. Even more important, every step taken is under rigid chemical control, so that the production of chemicals that are uniformly of the highest purity is assured.



Large rotary kilns used in calcining oyster shells into lime at Lake Charles plant of Mathieson Alkali.

Even the architecture of this plant is novel. Its three controlling factors were efficiency in production, mild temperatures, and winds that may reach a velocity of 125 miles an hour, and this combination resulted in a structure that is unique in appearance but admirably adapted to the work to be done in it.

The site of this plant was carefully selected with reference to supplies of salt, limestone, and fuel and to transportation facilities.

Salt is obtained from the West Hackberry salt dome, an immense plug of almost chemically pure salt, about 3 miles in diameter and hundreds of feet thick. Brine from this dome is piped to the plant fifteen miles away.

Lime comes from an equally unusual source. On the bottom of Lake Calcasieu, a body of water beside which the plant is located, lie billions of tons of oyster shells. These are dredged out, cleaned, and calcined, and produce the purest lime used by any ammonia-soda plant.

Fuel is obtainable in abundance, for both oil and gas are produced in the neighborhood of Lake Charles.

As for transportation, the plant is located on the three leading railways of the Southwest, the Southern Pacific, the Missouri Pacific, and the Kansas City Southern; and, since ocean-going steamers can enter Lake Calcasieu from the Gulf of Mexico and tie up at the plant's docks, its products can be carried by water to any seaport and to all points on the Mississippi inland-waterway system and the Great Lakes.

To facilitate water-borne deliveries from this plant, Mathieson operates a unique vessel known as the "Nickeliner," a diesel-powered tanker that was built especially for carrying liquid caustic in bulk. Her holds, designed in accordance with the specifications of Mathieson engineers, are lined with sheet nickel and have a capacity of 4000 tons of caustic liquor.

In addition to soda ash and caustic, synthetic salt cake is also being made at the Lake Charles plant.

Synthetic Salt Cake—Salt Cake, or sodium sulfate, NaS_2SO_4, is one of the raw materials used in making kraft-paper pulp. It is not used by the pulp maker as such, however, but after heating with carbon, which forms a mixture containing sodium sulfide, Na_2S, sodium hydroxide, NaOH, and sodium carbonate, Na_2CO_3. When this alkaline mixture is used to digest wood chips, it forms pulp with the long fibers characteristic of kraft stock.

Salt cake is a by-product of one method of hydrochloric acid manufacture, and, as the production of this acid by this process in the United States is relatively small (in relation say to sulfuric), little salt cake is produced here, the bulk of our needs having been, until recently, supplied by Europe.

Some years ago, the Mathieson organization realized that European supplies of heavy chemicals were likely to become uncertain, due to the conditions that led up to the second world war, and began developing a substitute for salt cake, known as synthetic salt cake.

This material consists of a mixture of soda ash and sulfur, intimately mixed and sintered together. It is not salt cake, but when it is given the proper treatment by the kraft-pulp maker, it produces the same active chemicals.

Production of this material began at the Lake Charles plant in 1939, using sulfur which is also one of the natural resources of this rich region. The time was most opportune, for war broke out before the close of that year, and all foreign supplies of salt cake were cut off. Because of this far-sighted move, the American kraft-paper industry has been little affected by a condition that might have been disastrous.

Metallic Magnesium

War is likewise responsible for another special product that is to be produced at Lake Charles, metallic magnesium.

In 1941, the United States Government asked Mathieson to produce magnesium and also to increase its output of chlorine.

On February 5, 1942, the formal contract was signed for the magnesium plant by officials of the Defense Plants Corporation and Mathieson.

The magnesium is to be obtained from dolomite, a rock consisting of calcium magnesium carbonate ($CaCO_3 + MgCO_3$), and closely resembling limestone. This rock is calcined, which produces the oxides of magnesium and calcium, which, in turn, are treated with calcium chloride, one of the products of the ammonia-soda process. The slurry is then treated with carbon dioxide, which converts the calcium into the insoluble carbonate, which is filtered off, leaving magnesium chloride. This product, after being concentrated, is electrolyzed, forming magnesium and chlorine, both of which are essential war chemicals.

The new plant, when completed, will have a capacity of 36,000,000 pounds of magnesium per annum and is expected to cost about $22,500,000.

Mathieson Weathers a Storm

Mathieson's course has not all been plain sailing.

During the first world war, the organization was subjected to conditions that almost brought about disaster. The demand for its products, which were vital war supplies, was far beyond its ability to produce, and, in a determined effort to make good, every piece of equipment was strained to the utmost. At the same time, its normal trade relationships were disrupted, and, since it had followed the accepted practice of the heavy chemical industry and had sold only through an exclusive selling agent, it was unable to maintain close contact with its real customers.

As a result, when the war ended, the run-down plants were unable to operate

fficiently and the company was faced with high production costs in a period of declining sales prices. It was at this time that Edwin M. Allen was asked to assume the presidency of the company.

Mr. Allen is a mechanical engineer by education and served his apprenticeship in the shops of the H. K. Porter Locomotive Works and in the drafting rooms of the Cambria Steel Company. But his executive ability was soon recognized. In less than ten years after graduating from Purdue University, he had become president of the Fayette Manufacturing Company and the Basic Brick Company and, a little later, organized the American Refractories Company. Therefore, when he became president of The Mathieson Alkali Works (Inc.) in 1919, he had had wide experience in the manufacturing field.

Rebuilding Program

One of Mr. Allen's first moves was to inaugurate a plant-rehabilitation-program which was so comprehensive that it took seven years to complete. He broke with established custom by dispensing with the plan of selling through an exclusive agent and was the first maker of heavy chemicals to sell direct to the consumer, through his own sales force. He organized traffic and technical service departments and extended the company's research and development facilities.

In the earlier history of the company, C. F. Vaughn, a vice-president at the time of his retirement a few years ago, was largely responsible for the successful development of the Castner Process used at the Niagara Falls plant for the production of chlorine and caustic soda. During World War I, Mr. Vaughn was a lieutenant-colonel in the Chemical Warfare Service in charge of the chlorine section at Edgewood Arsenal, and in 1939 was awarded the Jacob F. Schoellkopf medal for distinguished service in chemical engineering. Max Mauran, an engineering genius and a vice-president of the company at the time of his death some years ago, was chiefly responsible for the design of the multiple unit tank car and other early developments in connection with both liquid chlorine and synthetic ammonia. J. H. MacMahon, now retired, was at one time manager of the Saltville plant and later in charge of technical service during the period when industry was gradually switching from bleaching powder to the use of liquid chlorine.

The success of the present management has been reflected in the company's net earnings over the past twenty-odd years since Mr. Allen took over the presidency. In 1921, when the full impact of its difficulties was felt, Mathieson went into the red, but the net profits for the following year were almost a million dollars, and they have stayed close to, or have gone well above, the million mark in every year since that time.

George Ade, the humorist, a life-long friend of Mr. Allen, seconded his nomination for the Chemical Industries' Medal in 1930. Mr. Ade wrote: "I am not speaking as an expert—merely as a layman—but I know that he has achieved his success because he has been wise, thorough, far-seeing and keen intellectually. The figures for the Mathieson Company under his presidency tell their own story."

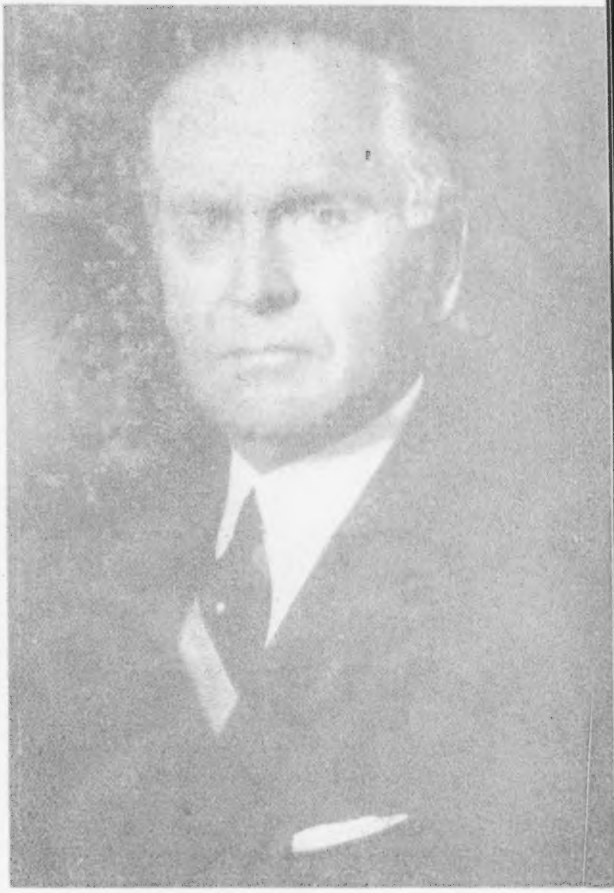
Today Mathieson again finds itself faced with the grim test of world war, its products vitally necessary in the manufacture or processing of nearly all war materials and supplies. Chlorine, in greater demand for war production than any other industrial chemical, is required in the making of high octane gasoline for planes and tanks; in making diethylene glycol used as the cooling agent in high-speed liquid-cooled engines; in chlorinated paraffins used in lubricants; in trichlorethylene, a degreasing solvent for plane engines and parts; in plastics used for cowlings and cockpit covers for warplanes and for insulating the famous degaussing cables used to protect ships from magnetic mines; in the production of smokeless powder and other explosives; in synthetic rubber for barrage balloons and other wartime uses; in carbon tetrachloride for fire extinguishers for tanks, planes and trucks; in processing textile fabrics of all kinds for the armed forces; in treating water supplies for both military and civilian use.

Chlorine for War

In fact, it has been estimated that one ton of chlorine goes into the making of each tank and two tons into the making of each plane! Other Mathieson chemicals, while not so spectacular as chlorine in their war uses, play an essential part in the production of iron and steel, aluminum, plastics, explosives, rubber (and rubber reclaiming), gasoline, lubricants, textiles, paper, food and medical supplies.

Thus the Mathieson organization, for the second time in the company's history, is engaged in an all-out production effort in order to contribute its share to American war industry in the trying days ahead.

A Saga of Salt—the story of the fifty years of existence of the Mathieson Alkali Works is the first in a series of articles portraying the vital roles played by leading chemical companies in the industrial progress of this nation in peace and war.



Edwin M. Allen

Containers of liquid carbon dioxide, ready for shipment.

Bonds for *VICTORY*

Voluntary payroll savings plan for purchase of United States savings bonds.

PRACTICALLY everyone has heard of the campaign being conducted by the Treasury Department for the sale of Defense Savings Bonds and Stamps. This campaign has received widespread publicity through the newspapers, radio, billboard posters, and in many other ways.

What may not have been equally well publicized is the fact that the Treasury Department has begun an active campaign to enlist the support of every wage earner in a plan for a voluntary allotment from his wages each pay day for the purchase of Defense Bonds and Stamps. What this plan means, when it becomes effective, is that each wage earner, from corporation president to the lowest paid employee, will voluntarily ask his employer to deduct a certain amount of his salary or wages and hold it for him until enough has been accumulated to buy a Bond. When a sufficient amount has accumulated, a Defense Savings Bond is purchased, registered in the employee's name, and sent to him by registered mail.

The tremendous task of organizing all those who earn a salary or wages in the United States has been undertaken by the Defense Savings Staff of the Treasury Department, assisted by committees of private citizens in each state. The General Committee for the Greater New York City area is under the chairmanship of Lewis E. Pierson, formerly of Irving Trust Company. The business life of Greater New York City is divided up into sixteen divisions, such as Finance under George L. Harrison, Public Utilities under Floyd Carlisle, Amusements under Stanton Griffis, etc. The Industry Division is under the Chairmanship of J. E. Crane, Treasurer of the Standard Oil Company (New Jersey). Under Mr. Crane's division, there are the following sections:

Iron & Steel	G. L. Edwards, U. S. Steel Corp.
Oil	A. T. Roberts, Socony Vacuum Oil Co. Inc.
Chemicals	P. M. Dinkins, American Cyanamid & Chemical Corp.
Drugs	R. D. Keim, E. R. Squibb & Sons.
Rubber	H. E. Humphreys, U. S. Rubber Company.
Paper	J. H. Hinman, International Paper Company.
Non-ferrous	C. E. Dodge, Phelps-Dodge Corp.
Coal, Coke & Ice	G. Pattison, Burns Bros.

The Chemical Section Committee consists of the following men:

J. J. Butler	Industrial Chemical Sales Division, West Virginia Pulp & Paper Company.
Earl Demmon	Stauffer Chemical Company.
C. L. Gabriel	Commercial Solvents Corp.
W. I. Galliher	Pittsburgh Plate Glass Company, Columbia Chemical Division.
Lester Gordon	Solvay Sales Company.
George F. Handel	Cincinnati Chemical Works.
Glenn Haskell	U. S. Industrial Chemicals Inc.
J. H. Karrh	Victor Chemical Works.
Fred Koch	The Dow Chemical Company.
J. P. Remensnyder	Heyden Chemical Company.
Ira Vandewater	R. W. Greeff & Co. Inc.
W. J. Weed	Niagara Alkali Company.
V. E. Williams	Monsanto Chemical Company.
P. M. Dinkins (Chairman)	American Cyanamid & Chemical Corp.

P. M. Dinkins, Chairman

The Chemical Section Committee held its organization meeting on January 15th at the Rockefeller Center Luncheon Club. At this meeting, Mr. Crane and Mr. M. Maurice of the Defense Savings Staff, outlined to the Committee members the plan of action. This plan calls for personal solicitation of the approximately 180 chemical companies in the Greater New York City area. The plan is to ask an executive of each company to commit the company to installing this plan and presenting it to the employees. It then becomes the function of the company to solicit the support of the plan by each of its employees. Each committee member has about a dozen companies to handle, and it becomes his task to call upon each of these companies regularly, assist them in installing the plan, and reporting regularly the total number of employees, the number of such employees subscribing, and the total dollar amounts subscribed per month under the plan. Each committee member sends a report to the Section Chairman on Tuesdays; the Section Chairman reports the totals to the Industry Committee Chairman on Wednesdays, and the Treasury Department in New York submits its detailed report for the entire state to the Treasury Department in Washington on Saturdays.

A simple plan has been worked out for the handling of Voluntary Pay Roll allotments in each company. A card provides on one side a space for the employee's name; the name and address of the Company; and the amount of the weekly, semimonthly, or monthly deduction. On this same side of the card is a place for the name or names in which the Bond is to be registered when purchased, and the address of the owner, co-owner, or beneficiary. On the reverse side of the card is a simple tabulation system for the Accounting Department of the company to follow. A deduction is credited on each pay day and the total funds are set aside in a special Employee Payroll Savings Account at the Company's bank. When the totals for any employees are sufficient to purchase a Bond ($18.75) a Company check on the special account is sent to the nearest Federal Reserve Bank, attached to the order form which they provide giving the name of the Purchaser and/or co-owner or beneficiary. The Federal Reserve Bank will mail the Bond to the employee by registered mail.

The Defense Savings Staff provides assistance to all employers—large or small in tying the plan in with their accounting system.

So far the results have been encouraging. Some companies already have 100% of their employees signed up. The goal, of course, is to have 100% participation for all employees and a substantial portion of the salaries allotted.

The purpose of the plan is not only to raise money for the Government to finance the war, but also to prevent inflation.

From an investment viewpoint, the Bonds are excellent. The Series E Bonds, which are the ones provided for under the Voluntary Pay Roll Allotment Plan, mature in ten years and accumulate interest at a rate of 2.9% compounded semiannually. Thus, a Bond which is purchased now for $18.75 pays $25.00 at maturity. A $75.00 Bond pays $100.00 at maturity.

The Committee for the Chemical Section is actively at work explaining this plan and obtaining the cooperation of the various companies. A number of the companies have already installed the plan and have the authorizations from a substantial number of their employees. Each day marks further additions to the list of those companies which have signed up. It is the hope of the Treasury Department that the voluntary participation in this plan by the employees of the United States will make unnecessary some more drastic tax measure for the financing of the war and the prevention of inflation.

CGMA Holds 29th Annual Banquet

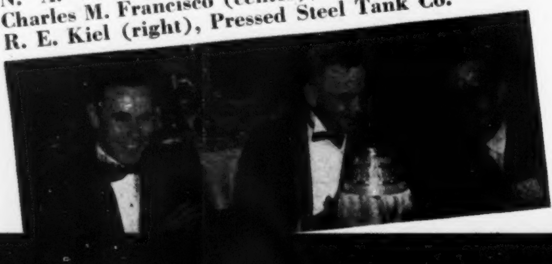
Left, F. H. B. Fowler, American Car & Foundry, and H. M. Mabey, Mathieson Alkali.

Scene at the 29th Annual Banquet of the Compressed Gas Manufacturers Association, Inc., held Jan. 27 at the Waldorf-Astoria, N. Y. City.

R. P. Dieckelman (left), Pressed Steel Tank Co.; (center), W. R. Pressler, Pittsburgh Testing Labs.; J. J. Crowe (right), Air Reduction Co.

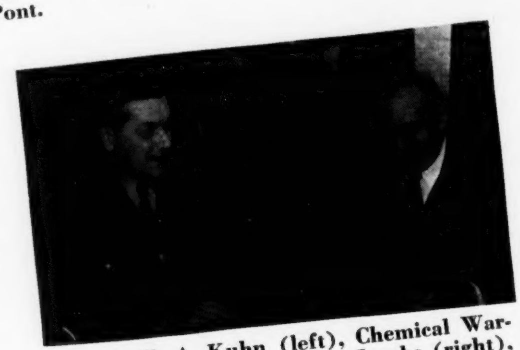
E. E. Routh (left), J. A. Kienle (center), R. J. Quinn (right), all of Mathieson Alkali.

N. A. Evans (left), Pressed Steel Tank Co.; Charles M. Francisco (center), Geron & Francisco; R. E. Kiel (right), Pressed Steel Tank Co.



J. A. Kienle (left), Mathieson Alkali; Commander R. S. Field (center) Director, Bureau of Marine Inspection & Navigation, Dept. of Commerce; H. Emerson Thomas (right), Phillips Petroleum Co.

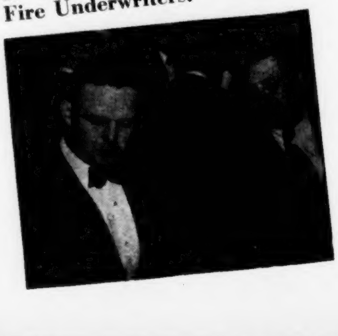
L. G. Seebach (left), du Pont Ammonia Co.; J. R. Eldridge (center), Virginia Smelting Co.; E. W. McGovern (right), R. & H. Chemical Division, du Pont.

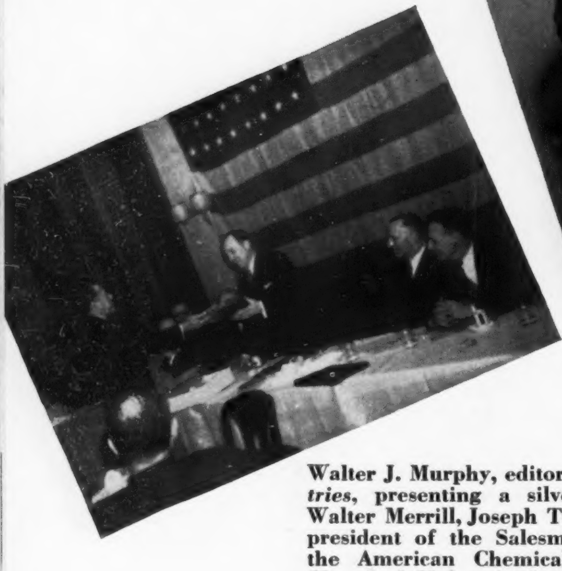


Lt. Col. H. A. Kuhn (left), Chemical Warfare Service, N. Y. C.; S. W. Jacobs (right), Niagara Alkali Co.

N. E. Bartlett, Pennsylvania Salt Mfg. Co.

F. W. Frost (left), Carbide & Carbon Chem. Corp.; A. C. Hutson (right), Nat'l Board Fire Underwriters.





Above, taken at the January 22d meeting of the N. Y. Section, A. I. Ch. E. at the Chemists' Club. Left, principal speaker, Dr. William J. Hale, research consultant to the Dow Chemical Co. and noted chemurgist, who spoke on "Chemurgy and the War Economy." Right, Dr. Robert J. Wilson, president of the Pan American Petroleum & Transport Co., who attended the meeting. To the left, B. L. Denker, application engineer, Worthington Pump & Machinery Corp. who spoke in place of F. J. Whelan on the new process for hydraulic disruption and transportation of coke from verticle coke chambers.

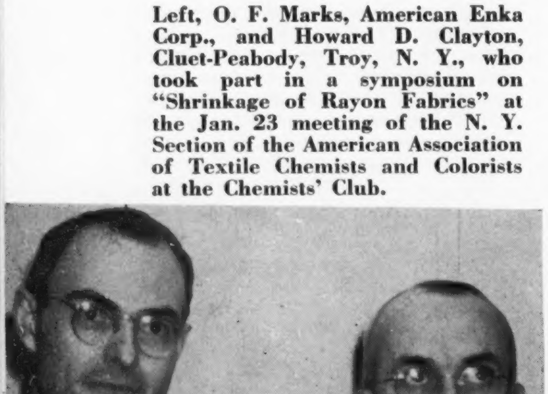
Walter J. Murphy, editor of *Chemical Industries*, presenting a silver service plate to Walter Merrill, Joseph Turner & Co., retiring president of the Salesmen's Association of the American Chemical Industry, at the Chemists' Club. At the right is Oscar Lind, Dow Chemical, new president of the association, and J. J. Butler, Jr., Industrial Chemical Sales Division, West Virginia Pulp & Paper, new vice president.

CI's Roving Photographer Covers Some Chemical Industry Meetings

Dr. Martin H. Ittner, Colgate-Palmolive-Peet, receiving the Perkin Medal for 1942 from Dr. Marston T. Bogert. Medal is awarded annually by the American Section of the Society of Chemical Industry for outstanding work in applied chemistry. Presentation was Jan. 10 at the Chemists' Club.

Above, Sydney Hogerton, district manager, Priorities Field Service, War Production Board, who spoke at a Priorities Roundtable on Chemicals held with the co-operation of the Commerce and Industry Association Jan. 20.

Left, O. F. Marks, American Enka Corp., and Howard D. Clayton, Cluet-Peabody, Troy, N. Y., who took part in a symposium on "Shrinkage of Rayon Fabrics" at the Jan. 23 meeting of the N. Y. Section of the American Association of Textile Chemists and Colorists at the Chemists' Club.



Below, left to right, taken at the Chemists' Club January Symposium held Jan. 21. Raymond F. Guy, Engineer in Charge of Operations of NBC, who spoke on short wave radio broadcasting; Dave Killeffer, *Industrial & Engineering Chemistry*, who conducted the symposium; and S. F. Woodell of NBC's International Department who also spoke.

CAUSTIC SODA

THE UNIVERSALLY USEFUL CHEMICAL

MARCHING MEN MUST BE CLOTHED

FEW CHEMICALS are as useful as Caustic Soda or serve so many diversified industries. Today, under the necessities of war time effort, the demand for Caustic Soda has increased enormously.

With armies of marching men being clothed and equipped in record time, the textile industry alone must be provided with vast quantities of this indispensable chemical. For in this field it is required for bleaching, dyeing and printing textiles and for mercerizing cotton fabrics to increase their color absorbing qualities and impart a silky gloss.

Vast and ever increasing quantities of Caustic Soda are also required in the production of rubber, soap, and plastics, in the refining of oils and fats, in the manufacture of paper and pulp, in mining and metallurgy. Availability is therefore an important factor. Dow is in an extremely strong position. Production facilities are geographically located to reduce distance between producer and consumers of Caustic Soda. You can rely on Dow and you will receive the fullest possible cooperation.

DOW

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2

1

Developments of Interest from Here and There in the Chemical Industry

3

SHORTAGES of metals (1) already are affecting furniture design. Airplane-type chair above is constructed entirely without metal. Plexiglas is the plastic used. (2) Porcelain insulator coating with new glazing material which eliminates use of strategic metals is shown here in a "puller-apart" machine at Westinghouse. Dr. Ralston Russell, Jr., research engineer records the results. (3) For steel that cuts steel, Westinghouse metallurgists have substituted a new tough alloy containing molybdenum in place of priority-bound tungsten. Engineers predict this substitution will be permanent. (4) Philadelphia Quartermaster Depot is charged by law with centralized procurement of practically all textiles and textile products for the entire Army. It relies to a great extent on chemistry in its work. Here leather is soaked in water and a sample of the water is placed in machine which determines amount of acid or alkali present in fabric selected for army uniforms material. (U. S. Army Signal Corps Photo). (5) Ability of fabric to shed or resist water is determined by this artificial rainstorm test. (U. S. Army Signal Corps Photo).

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IS HELPING MANY INDUSTRIAL EXECUTIVES TO ATTAIN THE MAXIMUM EFFECTIVENESS FROM THEIR ALKALIES TODAY!
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One of your most pressing obligations today is to get the most out of every ounce of raw materials. And Diamond is at your shoulder to help you fulfill that obligation. Call upon our experienced staff to help you "Conserve America's Resources"!
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NEW CHEMICALS FOR INDUSTRY

No, this isn't a lady ghost, it's a demonstration of an aid to operation of industrial plants during blackouts made at Calco Chemical Division of American Cyanamid Co. When blackout comes and only invisible ultraviolet light is permitted, clothes treated with fluorescent dyes glow brightly enough to be seen at close range. Note glow from the lady's shoe laces.

Digest of Chemical Developments in Converting and Processing Fields

FORMALDEHYDE from NATURAL GAS

By Harold A. Levey
Chemical Consultant

All of our formaldehyde, until recent years, came from the process using catalytic oxidation of methanol. New developments in petroleum technology, and the emergency, however, result in still larger quantities being produced from natural gas supplies for industry.

AMERICA'S armament program (we are now the "chemical arsenal of democracy") is of such tremendous magnitude that it is small wonder that former surpluses in a number of chemicals are now non-existent. Indeed we find ourselves necessarily seeking new sources of supply and new methods of production and, in many instances, ersatz materials.

Formaldehyde held a premier position in the first Priority Lists assembled by O. P. M. This was due in part both to the large volume of plastic products needed in aircraft, tank and navy construction, and subsequently by the gigantic increase in tonnage shifted to plastics by the need for the lighter metals for other purposes by this extensive construction policy. The shortage in formaldehyde, however, was to a very large extent the direct result of a shortage of methanol and the shortage of the latter is directly traceable to the urgent necessity of switching the du Pont methanol plant at Belle, W. Va., to ammonia as a defense measure.

Beginning with the striking growth of the plastics industry nearly two decades ago this industry promptly became the greatest single user of formaldehyde. It is unique in that this substance or its homologues is the only one used in all the thermosetting types of plastics, and these include phenol-formaldehyde, urea-formaldehyde, casein and other protein plastics. This accounts for possibly half of the total molded plastics on a weight basis. With a very large new plant producing a substantial percentage of our total phenol, the requirements for this component have been largely met.

Practically all of our formaldehyde has until recently been made by the catalytic oxidation of methanol. However, recent developments in petroleum technology have resulted in substantial supplies, approximating 30 per cent., coming from this source including natural gas.[8] While the direct oxidation of the lower hydrocarbons under controlled conditions has been known for some time past, the large yields of low molecular weight gases from present cracking processes gave new impetus to the use of debutanizer gases for purposes other than fuel. However, these gases as well as the major sources from petroleum products are such a hectic assortment of ingredients, that the resulting conversion materials involve heavy separation and purification costs.

In conducting this oxidation reaction it is quite apparent that to obtain satisfactory yields close control of this combustion process is required. We obviously desire to stop the oxidation at the aldehyde stage. No known process, however, yields more than minor percentages of the aldehyde. In fact the alcohol, the first stage of oxidation, always appears in greater amounts than the aldehyde. This is fortunate in view of the fact that the alcohol is readily oxidized to the aldehyde thus increasing the ultimate yield of aldehyde from a given hydrocarbon supply. Further oxidation results in the forming of the corresponding acid, while the ultimate products of oxidation or combustion might include carbon monoxide and dioxide. These latter products are of course to be avoided, because of their lower value.

While this is a relatively new art much pioneer work has already been done by the major oil refining companies, and many of the fundamental principles have been studied and are largely understood. This applies particularly to the lower members of the paraffin series, and especially to the first: methane, about which this discussion centers. Formaldehyde is, of course, obtained in the oxidation of higher hydrocarbons particularly unsaturated and certain cracked products. However, we are concerned particularly with the oxidation of methane to formaldehyde and the conditions and factors required for high commercial yields. The controlling factors might be included under the following headings:

1. Proportions of methane and air.
2. Conditions of temperature and pressure.
3. Catalysts used and their activity.
4. Time of exposure to conversion.

While methane is available in bountiful quantities from many petroleum refining operations, there is always present with it many of the higher hydrocarbons of this and related series. One is therefore impressed with its supply from natural gas many sources of which contain major amounts of methane. This is strikingly true of the natural gas wells in northeastern Louisiana and in the Monroe district it contains 94 per cent. or more of methane. This condition makes this source especially attractive for the production of formaldehyde. As a source of supply of oxygen, air is invariaby used in all commercial methane oxidation reactions. Some processes however use steam to supply both the necessary oxygen and the pressure. In proportioning the ratio of methane to the available oxygen in the air, experimentation has shown that it is preferable to use somewhat less than the calculated amount of air in order to avoid the formation of abnormally large quantities of more oxidized products. In fact it appears preferable to admit the air in reduced quantities and as the reaction proceeds, rather than all at one time. This is usually done at intermediate points prior to the recycling of the partly reacted charge when the additional amount of air and more methane is passed into the system.

As the reaction is exothermic, it is only necessary to supply heat to initiate the chemical change. The equipment usually includes pre-heaters, reaction chambers, heat exchangers and condensers, for the control and transfer of the heat to locations where needed and removed from areas where it is not desired. The reaction temperature seems to range between 350° and 600° C., while the pressures start at atmosphere and in some processes reach

250 atmospheres. Primarily temperature, and to a lesser extent pressure are the dominating factors used in practise to control the rate of the reactions and to some degree the yields of the products of the reaction.

While this conversion can be readily conducted without a catalyst, it is considerably accelerated by its presence with increased yields, better control of the reaction, much larger capacity per unit, lower temperatures and pressures, shorter time in the reactor chamber, reduced number of recycling operations or passes, and better selection in determining the types and quantities of end products. The catalysts may be gases or solids under operating conditions. The usual gas catalysts are the nitric oxides which function in a manner similar to uses in other processes in industrial chemistry such as in the chamber process for the manufacture of sulfuric acid. Phosphoric pentoxide and other gaseous oxides have also been studied. Among these are the lower alkyd oxides such as dimethyl and diethyl ether. However, the larger number of processes use oxides of metals having a variable valence.[2] The metals most useful as catalysts include molybdenum, vanadium, cobalt, silver, copper, iron, aluminum, chromium and zinc as well as platinum and palladium. Nickel is ineffective, while certain metals and their oxides are so active that they tend to produce a major yield of the ultimate oxidation product:—carbon dioxide. These catalysts are usually deposited on suitable carriers such as pumice, asbestos fibre, silica gel and certain inorganic salts, some of which act as catalyst accelerators. Several patented processes use combinations of metallic oxides and salts.[2]

The reaction rate is very rapid and as a result the exposure of the mixed gases to the catalyst in the reaction chamber is an exceedingly short time interval, usually a small fraction of a second.

The yields of formaldehyde per pass are usually relatively small varying from a small part of a per cent. to around ten per cent. This necessitates many recycling operations to obtain the maximum available amount of formaldehyde from the methane. The equipment and processing operations involved include separate compressors for the methane and the air which bring the gases up to the reacting pressure. The gases are then mixed and passed into a preheater which usually obtains its heat from the reacting chamber into which these mixed gases are conducted. Here they come into contact with the catalysts which may be in the form of a matt or screen, multiple tubes lined with a deposition of the catalysts, or they may be on trays or racks and similar forms known to chemical engineering practise. The partial conversion having taken place, the new mixture passes through a cooler, heat exchange, or condenser to remove the methane and air are then added in the tower to remove the formaldehyde. More methane and air are then added in the proper amounts, reheated and again forced through the system, the repetition of the cycle being continuous. The recovered methanol, which is usually in larger amounts than the formaldehyde, is oxidized to formaldehyde in a separate unit, though the same assembly may be set up and regulated to oxidize the methanol to formaldehyde.

Variations in Actual Practice

The above presentation is a generalization of the basic operations involved The many and varied processes described in the technical literature and in the patents vary widely from the above scheme. In order to render this presentation more comprehensive the salient facts of the more important processes will be presented.

Bitler and James[1] oxidize petroleum in vapor phase at 41° C. Oxidation begins at 225° C. Formic acid is formed in considerable quantities while smaller amounts of formaldehyde are recovered in the wash water as hexamethylene tetramine.

Burke and Fryling[21] use 0.8 per cent. of dimethyl ether as a catalyst with air carrying the 5.9 per cent. of oxygen. Reaction takes place at 450° C. and 750 pounds per square inch pressure. Contact time 0.185 second. Other catalysts used include vanadium pentoxide as well as the oxides of molybdenum and uranium catalyst deposited on asbestos fibre matted into screens through which the gases are passed.

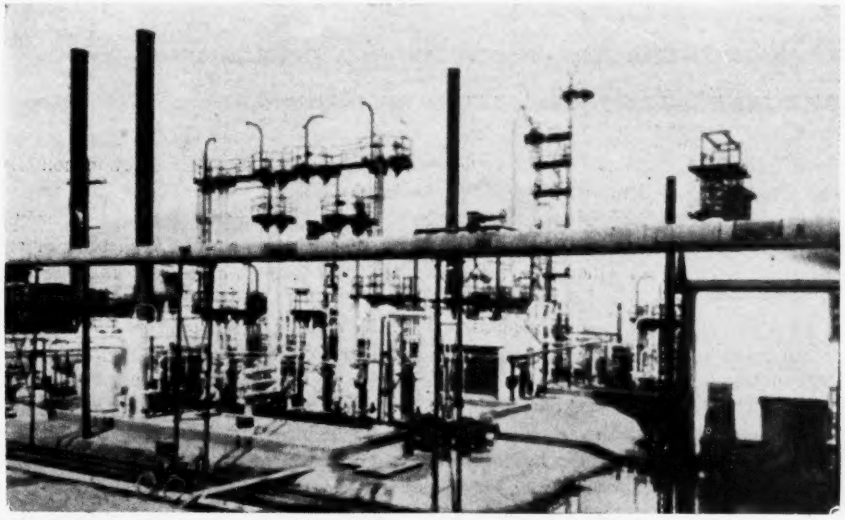
Methane and Air

Burke and Fryling[17] in another process mix methane and air in equal volumes and without any catalyst other than the metallic equipment used obtain formaldehyde and formic acid together with some of their higher homologues at 200 to 500° C. and 200 to 1750 pounds per square inch. With cobalt trioxide as the catalyst the oxidation is carried to completion and the products are made up almost wholly of carbon dioxide and water.

Yoskikawa oxidized methane at 1 to 100 atmospheres with various catalysts forming methanol and formaldehyde. Very active catalysts usually prevent the formation of these intermediate products.

Newitt and Townsend oxidized methane with oxygen in both static and dynamic systems. The gases were forced in at the predetermined pressure and temperature. The reaction was stopped by allowing the gases to expand into a second larger vessel. A maximum yield of 7.5 parts of formaldehyde and 82 parts of methanol from 7,540 of methanol and 177 parts of oxygen in nine minutes. Other products obtain included 198 parts of carbon monoxide, 242 parts of carbon dioxide and 1 part of acetic acid.

Walker[24] suggests a stepwise oxidation of natural gas in a series of reaction chambers. The gas is mixed with a small per cent. of air which generates sufficient heat to complete the reaction. The products are



Typical fractionating and recovery equipment used in the petroleum industry.

then passed through a condenser which is also a heat exchanger. The methanol is condensed and the formaldehyde is dissolved in water. The unreacted methane is mixed with more air and this cycle is repeated at temperatures between 425° C. and 500° C.

J. H. James[28] uses the oxides of molybdenum as the catalyst.

J. C. Walker[19, 20] designates silver or zinc in the presence of aluminum phosphate as catalysts and[28] as metallic catalysts platinum, palladium, chromium, iron and vanadium.

P. J. Wiezwich and P. K. Frolich[7] propose as catalysts the use of metallic silver and aluminum.

W. K. Lewis and P. E. Frolich[18] suggest as catalysts the use of the carbide-forming metals and their oxides.

H. Dreyfus[22] describes the use of 1 to 5 volumes of steam with one volume of methane to yield ethanol and higher alcohols at pressures of 180 to 250 atmospheres and 350 to 450° C. using potassium bichromate and zinc oxide as catalysts. No aldehydes, ketones or acids were formed. However, it was observed that when steam reacted with carbon monoxide in the presence of chlorine or hydrochloric acid, formic acid was formed.

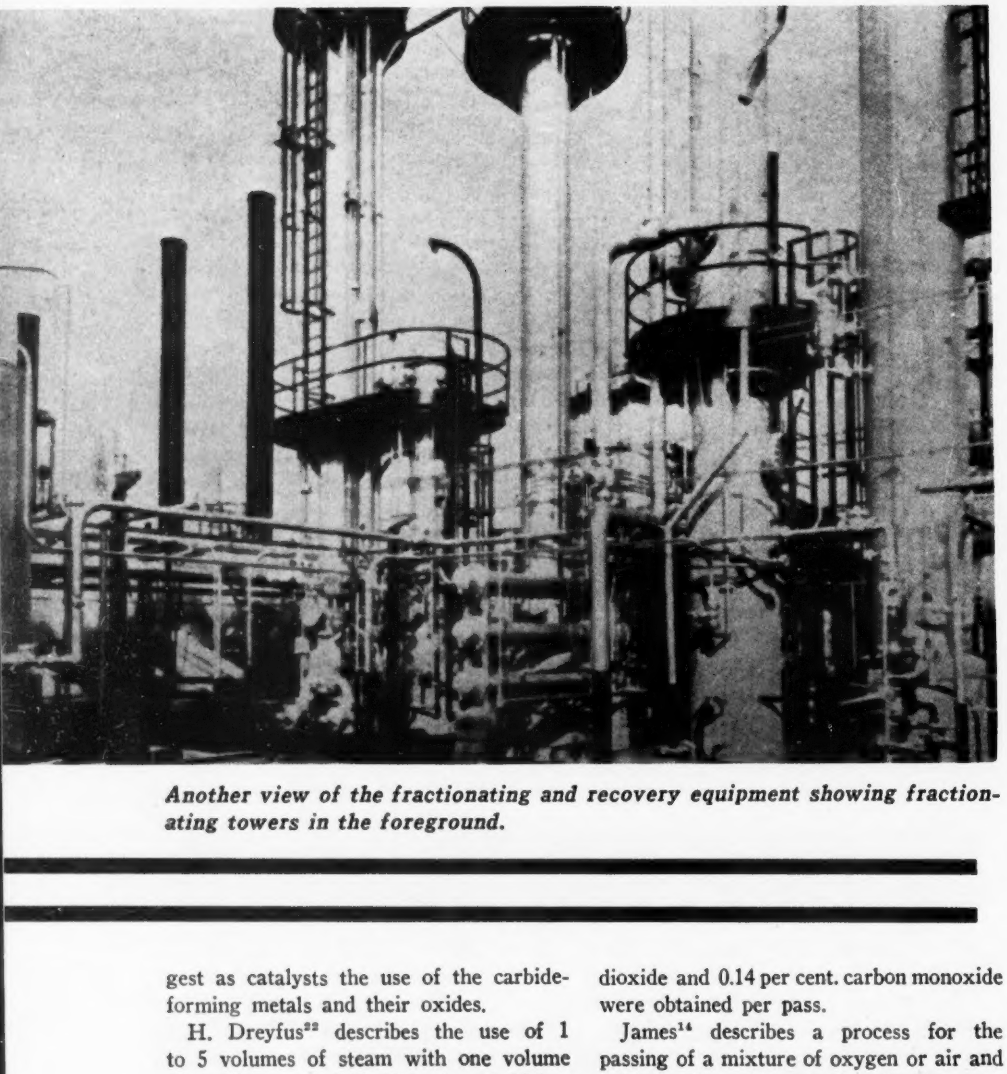
Gurevich and Chervenshaya[4] found that copper gauze was the optimum catalyst with temperatures of 360° C. for oxidizing methanol to formaldehyde. When the reacting gases were made up of methanol vapor and 52-57 per cent. of the theoretical amount of oxygen, the yield of formaldehyde was 92-93 per cent. Silver deposited on pumice gave a 90 per cent. yield, and silver on copper gave 92 per cent. of the theoretical yield.

Frear[3] oxidizes hydrocarbons directly to aldehydes at atmospheric pressure or lower at 600° C. using 77 parts by volume of methane and 21 parts of air all at 760 m. m. The yield of formaldehyde increased with the time of contact up to 54 seconds, when a yield of 0.23 per cent. of formaldehyde, 10.0 per cent. carbon dioxide and 0.14 per cent. carbon monoxide were obtained per pass.

James[14] describes a process for the passing of a mixture of oxygen or air and methane through a reaction chamber containing blue oxides of molybdenum as the catalysts. The products of the reaction are treated to separate the formaldehyde after which more air or oxygen and methane are added and the mixture recycled.

Tikhomirova and Monakhova[5] suggest the use of a mixture of cracking gas and air with vanadium pentoxide precipitated on kaolin as the catalyst. The reaction is conducted at 280 to 340° C. yielding 5-11 per cent. of formaldehyde and 2 to 3.5 per cent. of formic acid and 6 to 7 per cent. of acetic acid; 8 to 10 recyclings being required.

From these data we are attracted by the relatively low yields per pass, and that many recycling operations are required to obtain satisfactory quantities of formaldehyde for commercial operation. For economy of operation highly efficient heat exchangers are required, as the temperature of the gases pass through a range of many hundred degrees centigrade in completing each cycle. Much progress has been made and we are in possession of much fundamental data regarding the control of the process and the factors governing its efficient operation.



Another view of the fractionating and recovery equipment showing fractionating towers in the foreground.

Author's Conclusions

Undoubtedly ever increasing amounts of formaldehyde will emanate from this source. In addition, this source of formaldehyde will be well able to sustain, it is expected, its position in competition with the high pressure synthesis source since the conversion operations are less costly and substantially less investment in physical equipment is required.

The very low cost at which practically pure methane is available in almost unlimited quantities in the above designated areas and the relatively stable price which formaldehyde has enjoyed over a long period is very inductive to a process of this type.

Even after this emergency it is apparent that the rapid growth of the molded plastics industry will continue very likely to require all the formaldehyde that can be obtained from the present plants as well as from many new plants for formaldehyde production which will undoubtedly be constructed in the near future now mainly in the name of war and defense.

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27. British Patent No. 433,559.

New Products and Processes

By James M. Crowe, *Assistant Editor*

SULFAMIC ACID, a new industrial chemical for fireproofing textiles, exterminating poison ivy and ragweed, and tanning leather, is now being produced by large-scale methods, by E. I. du Pont de Nemours & Co., Inc., at Grasselli, N. J.

Sulfamates are to a high degree compatible with cellulose and thus an extensive use as flameproofing agents is anticipated, according to Drs. M. E. Cupery and W. E. Gordon, du Pont chemists, in a report on "Sulfamic Acid—An Industrial Review." Paper decorations and insulating materials, mattresses, negligees, children's party dresses, and clothing of workers exposed to flames are some of the instances where this fire retardant should serve valuably.

The report states that:

"Probably the use of sulfamic acid which will appeal most to the public is the lethal effect of ammonium sulfamate upon weeds. Ragweed, which causes an estimated 85 per cent of hay fever; poison ivy; wild cherry, host for orchard diseases and insect pests; and many other obnoxious plant growths can be safely eliminated merely by spraying. Most of the previous weed-killers, in addition to being either inflammable or poisonous, seriously impaired the fertility of the soil for long periods. Ammonium sulfamate offers no trouble on this score, nor is there ground for fear that animals will suffer from eating sprayed foliage."

Of more direct commercial interest, the report continued, is the use of sulfamic acid for eliminating excess nitrite in dye and colored pigment manufacture. In a representative pigment manufacturing process which originally required twenty-five pounds of urea and three hours to complete excess nitrite removal, four pounds of sulfamic acid now complete the same reaction in approximately five minutes. Because the reaction may be closely controlled, cleaner shades of color with better uniformity in batches is possible, it was pointed out.:

"One of the first industrial applications to be developed for sulfamic acid is based on its reaction with nitrous acid," the report said. "This reaction is exceedingly rapid and proceeds quantitatively, thus making possible improved analytical procedure for the determination of nitrites. For this reason, sulfamic acid has been useful in determining the demand for dissolved oxygen in sewage treatment and river pollution studies. A method for determining the sulfanilamide content of blood also depends upon this characteristic of the chemical."

Sulfamic acid, for over sixty years a laboratory curiosity with scarcely a known practical use, is endowed with unique properties, it is shown by experiments conducted in the du Pont laboratories during the past four years. It is a non-hygroscopic solid, and commercial packaging and transportation presents no problem. In water solution, it is a strong, highly ionized acid.

Miscellaneous potential uses for sulfamic acid outlined by Drs. Cupery and Gordon included laundry finishing, gas liberating compositions, photographic compounds, metal polishes, solubilizing polymeric or high molecular weight amines, peptizing pigments, polymerizing olefins, and acidizing oil wells.

Camouflage Paints

Camouflage paints for concealing strategic military and civilian objectives by making them blend in with the colors of the surrounding earth and foliage to prevent spotting by aerial cameras and bombers, were announced recently by the Sherwin-Williams Company. The new paints are made in such colors as field drab, earth brown, and dark green.

The new paints are designed for spreading over roofs, buildings, streets and other structures which disclose the presence of a bombing objective or which serve as landmarks from the air. They are said to dry without gloss or reflections and permit streets to be "painted out" or nonexistent streets to be "painted in," and make conspicuous objects merge into the natural background. They adhere to practically any type of surface from glass to asphalt roofing, and may be spread over blacked-out windows, roads, sidewalks, tanks, smokestacks, railway ties, etc.

British camouflage experts have done an effective job in remaking the British landscape by the use of camouflage paints and similar devices, according to the Sherwin-Williams officials. In many cases industrial buildings have been made to look like a row of cottages by clever painting. Strategic roads have been rendered inconspicuous while faked roads were introduced, running across fields, factories, houses and whatever happens to be in the way. The company points out, however, that no camouflage painting should be undertaken until authorized by the local director of camouflage.

Paper Process

Fine bond and writing papers, normally made from pulps consisting largely of cotton fibers derived from garment factory clippings and other rags, can now be made from such cotton by-products as hull shavings and the waste from ginning, carding, and other cotton-cleaning operations, according to an announcement by the Crane Co., paper manufacturers of Dalton, Mass.

These products were not used formerly because they contain many dark-colored particles of cotton seeds and leaves, called motes, and, unless these motes are removed, they discolor white and light-colored papers. It is difficult to remove these mechanically for paper making and it was thus necessary to find a chemical method for overcoming these discolorations.

The process was worked out through research work carried on jointly by the Mathieson Alkali Works, Inc., and Crane & Co. It consists in digesting the cotton in a liquor containing caustic soda, a suitable wetting agent for wetting the cotton, and from 0.3% to 0.5% of C2 based on the weight of the cotton. The strength of the caustic soda solution varies with the type of cotton being treated. Either a rotary or a stationary digester may be used. A pressure of approximately 30 pounds per square inch has been found sufficient for most grades of cotton.

The caustic soda cleanses the cotton of many of its natural impurities. The C2, which is sodium chlorite, a heavy chemical recently developed by Mathieson, in a form suitable for use in pulp making, attacks the motes but does not attack and weaken the cotton fibers. The wetting agent, which must be suitable for use in an alkaline medium, facilitates the wetting of the cotton by the digestion liquor and accelerates digestion.

After digestion, the pulp is washed, beaten, washed, and bleached by conventional methods in conventional equipment.

On completion of the process, the pulp is of uniform color and contains no motes. The cellulose fibers retain their original strength and no oxycellulose or other degradation products are formed. Paper made from the pulp compares with the best quality of cotton-rag paper in every respect.

Electrical Insulation Tubing

Irvington Varnish & Insulator Company has announced its new Fibronized Koroseal Tubing designed for use as electrical insulation by manufacturers in the electronic, instruments, aircraft, electrical appliances and power industries.

This new insulation was developed by Irvington's Fibron Division from Koroseal, a product of the B. F. Goodrich Company.

The advantages of Fibronized Koroseal are said to include inside and outside smoothness, exceptional elasticity and close manufacturing tolerance. It resists

acids, alkalies, solvents and heat, is fireproof and possesses an insulation resistance of infinity after 16 hours at 90% R. H. and 105° F. As a result of the A.S.T.M. Test of beoing subjected to 225° F. for approximatey 1000 hours, it was found to have retained its flexibility.

New Lacquer

Roxalin Flexible Lacquer Co. has recently put out a new enamel finish called Rincontron. The company claims that one coat of this wrinkle finish is sufficient to give a uniform appearance on both cast and sheet metal without the use of primer and surfacer. The product has good adhesion qualities, standing up well under rough usage without chipping or flaking. Products finished with Rincontron resist salt spray and humidity, eliminating the use of special corrosion resistant finishes, thus permitting a decorative finish on areas exposed to moisture. This enamel is suitable for use on sheet steel, die castings, aluminum, and wood.

Cleaner and Rust Proofer

Ruscat is a new rust-proofing and metal cleaning solution just developed by the Research Laboratories of The United States Stoneware Co. Its principal use is for the cleaning and preparation of metal surfaces before the application of corrosion-resistant paints and coatings and also for the purpose of preventing further rust formation.

The use of Ruscat produces a mild etch over metal surfaces, resulting in the development of a chemically adherent inorganic base over which the lacquers and coatings are made to gain their maximum adhesion. A thorough chemical cleaning of the minute pores of the metal is achieved along with the removal of all surface contamination, scale and rust.

Ruscat may be applied by brushing or dipping. After a few minutes, the solution may then be wiped off and allowed to dry.

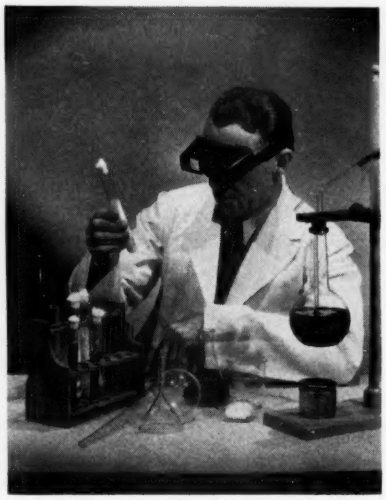
Another use for Ruscat is to facilitate the handling of iron or steel after long exposure, storage and handling,—prior to being used for fabrication, etc.

New Wax

Nipocer, suggested by Glyco Products Co., Inc., as a replacement for Japan wax, is a tan colored wax with a melting point of 46°-49° C. It blends with most waxes and resins and is easily emulsified with the usual emulsifying agents. Nipocer is being used in textile preparations, lubricants of various types, protective coatings, impregnants, polishes, and for most purposes where a wax with the properties of Japan wax is desirable.

Laboratory Notebook

NECESSITY being the mother of invention, and defense being the necessity of the day, there have been many ideas and inventions brought forward in the past few years. One of these recent new developments that may be used by many trades is the new Magni-Focuser Eye-Shade, put out by Edroy Products. This new eye-shade is equipped with a pair of stereoscopic five power magnifying lenses, which by a slight tilt of the head the subject is brought into focus greatly magnified. The wearer, when not using the lenses, can readily look beneath the shade with his normal vision. It also affords him the use of both hands instead of using one hand as with the ordinary magnifying glass.



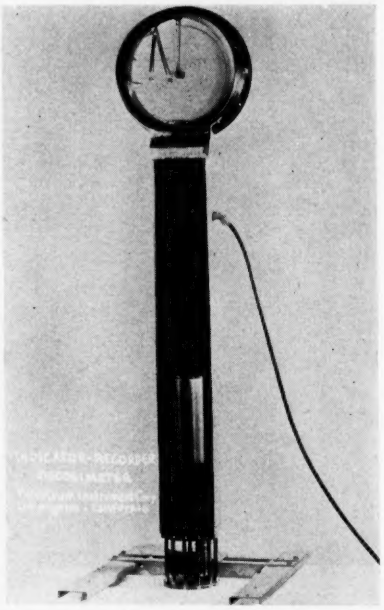
The eye-shade is strongly made of plastic, affording protection to the eyes of the wearer from particles of steel or shavings. It was designed for the use of mechanics, engravers, doctors, dentists, chemists, photographers, tool and die makers and others employed in the defense industry.

New Viscosimeter

Accurate and continuous measurement of the viscosity and specific gravity of liquids is made possible with a recording instrument recently introduced on the market, according to its manufacturer, the Petroleum Instrument Corporation. Originally designed for measurement of fluids used in drilling oil wells, this instrument has been successfully adapted for use in other industries.

A continuous record of viscosity and specific gravity is recorded on a 12-inch, 24-hour recorder chart. Viscosity is registered in centipoises of absolute viscosity and the gravity in pounds per cubic foot, pounds per gallon or specific gravity.

Viscosity measurement is accomplished by a smooth cylindrical solid metallic rotor on the base of the rotor assembly that is submerged in the fluid to a minimum of 4 inches. This is kept revolving at a constant speed of approximately 250 revolutions per minute by a small synchronous motor. Turning inside a cage containing six stationary blades, it shears the liquid between its surface and the vanes, thus exerting a torque against the motor that is proportionate to the liquid viscosity. This is then transmitted to the recording dial and registered automatically on the chart.



The rotor is suspended on a weighing mechanism so that the buoyant force of the liquid, which is proportional to the specific gravity, is also transmitted to the instrument in terms of specific gravity.

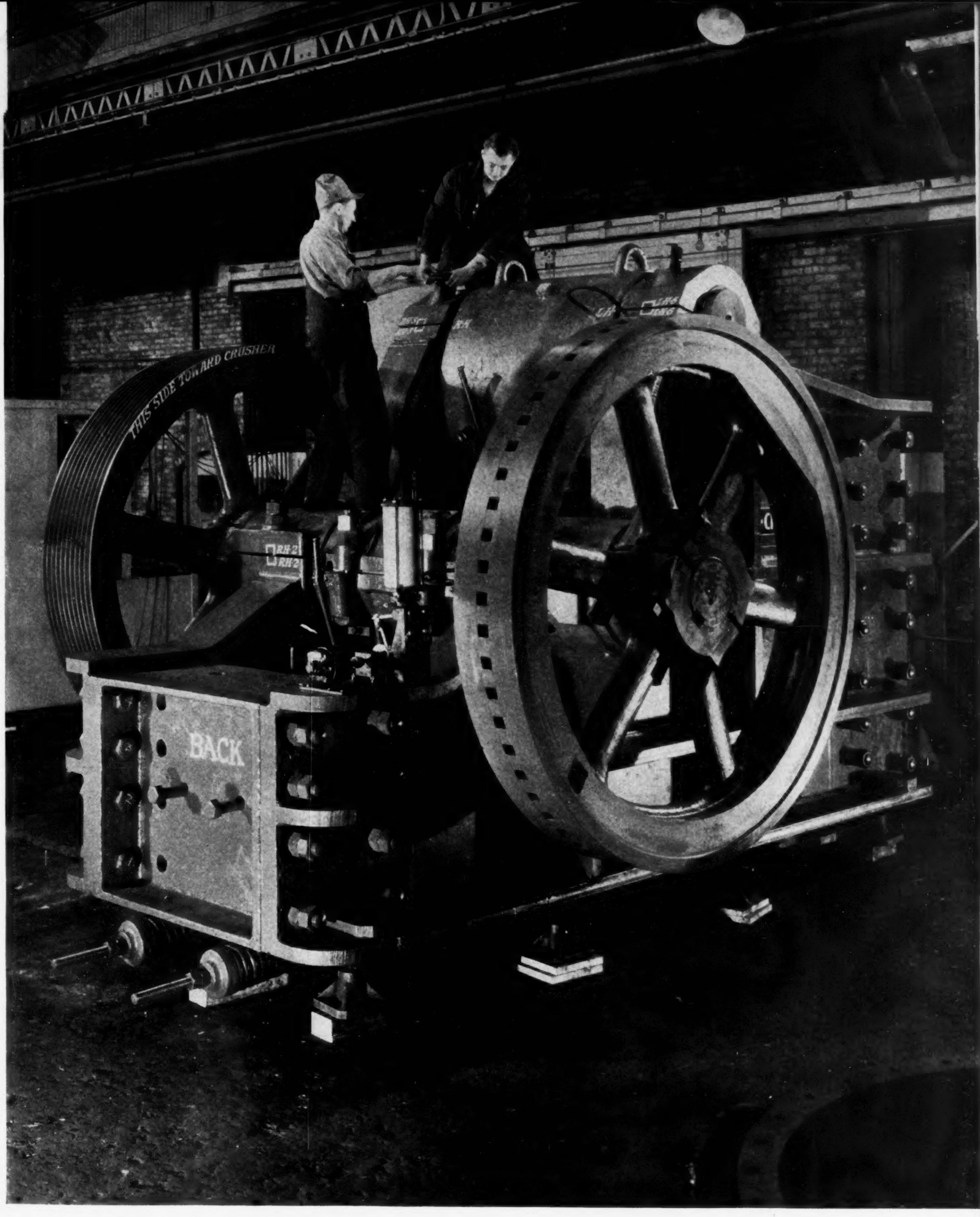
Light in weight, simple in design and rugged in construction, this instrument operates on 110 volt AC current. All its parts are contained in one compact unit.

Specifications: Height, 5 feet; width, 6 inches; overall depth, 6 inches; diameter recorder cabinet, 14 inches; weight (with bracket), 60 pounds.

Vitamin Testing Apparatus

The Scientific Glass Apparatus Company has compiled a bulletin to serve as a guide for the technologists interested in the analysis of vitamin B_1 and B_2. The essential units for the analysis of these compounds are described and illustrated, including the spectrophotometer and electronic photofluorometer.

The company is maintaining a file of new apparatus and methods for vitamin analysis.



PLANT OPERATION AND MANAGEMENT

West Allis works of Allis-Chalmers recently completed an all-steel ore and rock crusher of entirely new design. This one is first of several on order. It will replace older type with cast iron frames. New design will be used in war program for crushing very hard ore.

Digest of New Methods and Equipment for Chemical Makers

Instrumentation and Automatic Control

Calco Chemical Division reports on engineering and maintenance of instruments for production at the Bound Brook, N. J., plant.

By W. B. Heinz, Engineering Department, and W. T. Henrichson, Mechanical Department

Instrument panel boards are needed to control operation of chemical-producing tools.

←

Mechanics at work installing instruments in a new panel board. Instruction diagrams are provided by instrument section of Eng. Dept.

An instrument might be called the conscience of a chemical-producing tool. It records, often right down in black and white for all to see, just what its behavior has been. Without the instrument, the tool may get into trouble. Pressures may rise too high and cause explosion. Temperature, varying from its proper course, may spoil batches. In many ways such as these, instruments guide, control, protect and, at times, supervise the production process.

In Calco's hundred-some-odd-building plant, literally thousands of many kinds of instruments are used. Many thousands of these delicately constructed mechanisms help engineers and operators to keep production processes flowing smoothly. Now, at a time when American industry's drive for victory is making every affected plant strain to its limit of production, these instruments assume new importance. For full reliance upon the smooth performance is more and more vital as machines are called upon to produce more and as labor becomes scarcer.

Fundamentally, there are two aspects to the whole problem of instrumentation. Right back at the beginning engineers must answer the question, "What instrument?" as they design a tool or process. What type of instrument, what is its function, how to operate it—these are all questions solved by the engineers as part of their business of designing.

There's another phase, though, that's vitally important. That's a mechanical one—installation, maintenance and repair—the work of highly trained, skilled mechanics is needed here. The technique of keeping instruments in proper condition is tremendously important. For an inac-

curate instrument is fully as dangerous as none at all.

Calco instrumentation is engineered by a special section in the Engineering Department, while the installation and maintenance work is handled by a separate section in the Mechanical Department.

The engineering of instrumentation and automatic control usually follows the consecutive steps which are briefly listed below:

1. Study of the manufacturing process to determine the instrument functions which are required.
2. Consideration of the several basic types of instruments which might be used, in order to select the most suitable one.
3. Choice among the several makes and models of instruments of the basic type which has been selected.
4. Selection of instrument ranges, scales, charts, construction materials, detailed dimensions, etc., to conform with an organized standardization plan.
5. Preparation of complete ordering specifications, entered on a bill of material for the Purchasing Department.
6. Preparation and issuance of installation instructions for the Mechanical Department.
7. Examination of instruments which have been ordered, when they arrive. This step is essential not only as a final check against the suitability of each instrument for its proposed application, but also to keep the engineers up to date with respect to new and improved instruments as they become available.
8. General supervision during installation, and accumulation of experience through field observation of the Mechanical Department's problems.
9. Preparation of operating instructions for the Production Department to assist those men in using the new instruments correctly and effectively.
10. Starting up unusual instrumentation and performing initial adjustments and changes.
11. Continual contact with maintenance problems, through field association and analysis of maintenance records, in order that new engineering can strive toward reduction of maintenance costs.

The Process

The first requirement is an understanding of the process itself. Necessary thoroughness of understanding depends upon the complications involved. For simple jobs, suitable instruments are immediately obvious; whereas complicated control systems may require weeks of study to list the most suitable instruments.

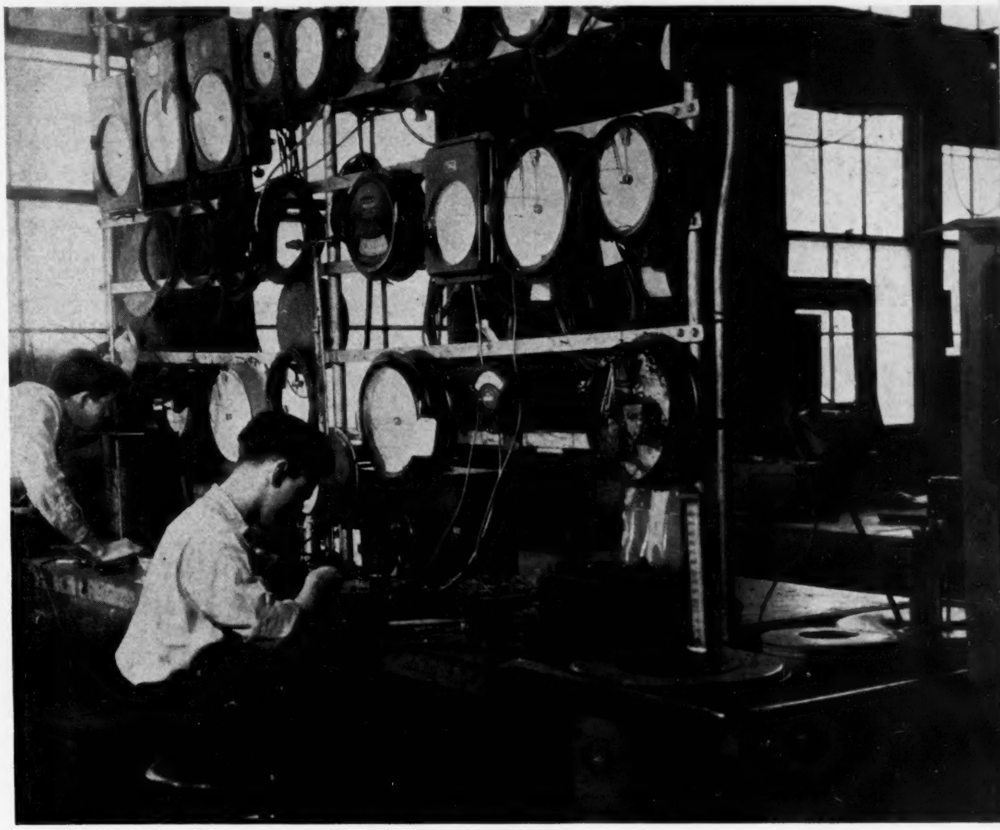
The fundamental problem is to select instrumentation which will net the most profit. The initial cost, cost of operation and cost for maintenance must be considered in comparison with the contemplated earnings from the proposed equipment. There are no mathematical formulae which can be relied upon to determine which of several alternative combinations of apparatus can best be used. Only accumulated judgment can do that; and the concentrated efforts of engineering specialists are essential to the development of bases for sound judgment in a specialized field containing so many variables.

Almost every critical process should be partially, or completely, under the control of automatic instruments, with an operator to supervise the instruments. Exceptions are those processes which are so complicated that automatic control is of questionable practicability; and those rare processes in which a departure from control would be so extremely costly that highly paid, specially trained operators are justified.

It is considered important to have every operator understand that new instrumentation is not intended to supplant his functions or to reduce his responsibility. Instruments are nothing more than assistants for the operators, who must supervise them as they would supervise human assistants.

Types, Makes and Models

Temperatures are measured industrially by thermocouples, resistance thermometers, radiation instruments, pressure type thermometric systems (gas filled, liquid filled, vapor pressure), and by various combinations of the foregoing where it is important to have measurements checked by others. Pressures are measured by manometers, gauges utilizing Bourdon tubes, helices, spirals, bellows, diaphragms, and the like. Liquid levels can be measured by various arrangements of floats, by direct measurement of pressure at a point beneath the surface, by the pressure required to force a gas into a liquid at a point beneath the surface, and many others. Similarly, all the other common chemical process variables can be measured by any one of several basic types of instruments.

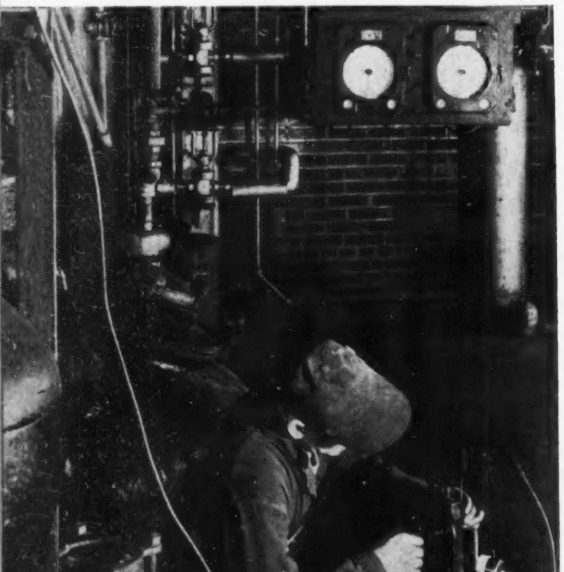


Bench in the instrument shop at which thousands of instruments are serviced by skilled mechanics and a well-equipped shop. Large stock of spare parts and other equipment must be kept on hand for any need that comes up.

The same variables can frequently be controlled through the addition of control mechanisms to measuring apparatus. Such controls may be self-actuated, by energy furnished from the process itself, or they may be servo-actuated, utilizing power from electricity, compressed air, oil, water and the like. Servo-operated controllers are always more sensitive and precise, and are substantially the same in reliability as self-actuated devices. The trend is definitely toward more extensive use of servo controls.

Calco uses hundreds of temperature measuring instruments using pressure

type thermal systems. Most of these are of the gas-filled type, preferred because their uniformly graduated recorder charts are interchangeable among many applications, because the thermal systems can be easily recharged in the instrument shop without sending out to the manufacturer; and because their cost is nominal. Temperatures in higher ranges are measured by thermocouples or radiation pyrometers, used in combination with both indicating and recording potentiometers. Iron-constantan thermocouples are also used in



Routine testing of instruments is important. Here, instrument mechanic is making hot oil test of thermometer apparatus of pressure vessel. In background is recording equipment for thermometer that is being tested

great numbers for checking purposes by installing a thermocouple beside a thermometer bulb in the same well. A service man with a portable potentiometer can thus quickly connect to the thermocouple leads and check the calibration of the recording thermometer without disturbing the process.

Resistance thermometers are used primarily where unusually high precisions are required and for the lowest temperature ranges.

The choice between indicating and recording instruments for a given measurement must be made by judgment of the relative importance of the several considerations which enter into each case. The original cost for a recording installation is generally higher. There is a continued cost for chart renewals, and somewhat greater maintenance than for indicators. However, recording instruments provide well-known advantages in that they show what actually happened, in records which are free from reading and writing errors. Second, they show an operator rates of change, both instantaneous and cyclical. He is thus enabled to do a better job of manual control than he could have otherwise. That human faculty which no instrument can possess—anticipation—depends largely upon knowledge of rates of change, and is thus used most effectively in conjunction with recording instruments.

A less well-recognized advantage of a recorder appears when it is used in conjunction with an automatic controller. Here, adjustment of the controller to match the requirements of the process is best made with the guidance of the recorder. In processes difficult to control, such adjustments are nearly impossible without a continuous record.

Finally, recording instruments are completely essential when batch process cycles are to be duplicated repeatedly. Only by this means can a template be used to lay out in advance for an operator the exact course which the temperature, pressure or other critical variable should follow.

Standardization

Experience has shown that it is unwise to concentrate too completely upon instruments made by any one manufacturer. It is also unwise to scatter too many different makes throughout the plant for obvious reasons of replacement and spare parts stocks. Selection of temperature recorders provides an example of the policy which is preferred.

Here, practically every range and chart requirement can be furnished by one manufacturer, who is regarded as the basic supplier of that class of instrument in the plant's standard list. Certain frequently used ranges and charts are also purchased from additional manufacturers. Thus, whereas our service on recording thermometers depends more extensively upon one manufacturer than upon any of the others, it is always possible to shift more strongly toward the others in the event that anything should happen to the preferred vendor.

Similarly, one manufacturer gets most of the business in steam flowmeters; another furnishes most of the recording potentiometers. Certain types of controllers come almost exclusively from an additional manufacturer.

At one time it was felt that standardization was desirable in order to reduce the number of recorder charts which had to be carried in stock. It has subsequently come to be recognized, however, that the stocking of charts is a matter of small importance. The fundamental consideration in a program of standardization is that of instrument service and maintenance.

A standard instrument list has consequently been established and all new purchases are selected from this list if possible. The items in the list are chosen for the greatest possible flexibility in application so that a satisfactorily complete list can include the minimum possible number of different items. Wherever possible, several different charts are available for use on each instrument; for example, a change among 8-hour, 24-hour and 7-day charts can be made simply by changing the clocks and furnishing the new charts to the shop.

An order for five recorders was placed recently with one manufacturer instead of another because the second vendor required a change of calibration in order to change from 24-hour to 7-day charts. This manufacturer consequently lost this and other orders because he had not paid sufficient attention to practical standardization.

In the interest of economy, as small as possible a stock of spare parts and replacement instruments must serve as large as possible a group of installations.

Specifications and Instructions

When bills of material are made out, from which the Purchasing Department works, so-called "Calco Tool Numbers" are assigned to the major items being ordered. Complete specifications and description are entered upon standard 8½" x 11" forms, which are filed by these numbers. These tool cards thereafter provide a complete record of each major instrument from the time that it was first specified on through various relocations, recalibrations, and the like, which are entered in turn on the cards.

Installation instructions tell the Mechanical Department what instruments to install and where to put them. Complete with drawings, copies of bills of material, references, and so forth, these instructions enable the shop to proceed with a job from start to finish with nothing more than occasional checking back and forth to avoid mistakes.

Drawings of panels, panel supports, special instruments of Calco manufacture, connection diagrams for electrical and piping systems, among other equipment, are standardized and tabled as extensively as possible. Thus, a new installation can at times be described by reference to a line on an already existing drawing. At other times, a new item need only be added to the table on an existing drawing. At other times, a new drawing must be made; but on making this, the question is always considered as to whether or not this new drawing should be made up as

an additional tabled drawing for general use. Piping details, and the like, are as frequently as possible added to general piping and layout drawings, prepared by other sections of the Engineering Department.

Automatic control systems of the more complicated varieties require more or less elaborate operating instructions for the use of the Production Department. Such operating instructions relating to instrumentation are prepared by the Engineering Department, usually before the equipment is first started up.

The starting up is done under the supervision of the Engineering Department, which takes care of initial adjustments, such changes as may be found to be necessary, etc. After the equipment has been put into satisfactory operation, the operating instructions are brought up to date and formally entered into the standing instructions for that process.

Unusual maintenance troubles are reported back to the Engineering Department, which redesigns equipment and installations where necessary. Needless to say, records of maintenance also are influential in new design.

Experience at Calco has shown that instrumentation requiring such a specialized form of engineering can be handled most effectively by a central group of specialists who serve all the other engineering and production sections. The Calco organization set-up is such that a proposal for new instrumentation must satisfy the requirements of the Production Department, the Division Engineer for his production division, and the head of the Instrument Engineering Section. Collaboration among these three groups has resulted in a predominance of successes among Calco's instrument and control applications, with only rare failures.

Mechanical Department Functions

The organization of a staff of mechanics to install, maintain and repair the instruments in Calco's plant is the result of considerable experimentation. These instruments include recording and indicating thermometers, of which there are between 1,500 and 2,000 in the plant, roughly, 500 scales, nearly 1,500 safety valves, 250 to 300 safety discs, 200 some-odd controllers, nearly 100 flowmeters, approximately 3,000 pressure and vacuum indicating gauges, and some 2,000 miscellaneous instruments such as potentiometers, gas analyzers, water and gas meters, safety equipment, and so forth.

Experience has shown that the maintenance and repair problems are closely allied with a program of routine testing that has been developed by the Instrument Section. Month by month, statistics show that the frequency with which it is possible to test meters is closely related to the number of breakdowns and repair jobs. Some instruments should be tested daily; others as infrequently as yearly. In between are schedules of testing ranging from twice a week to weekly, semiweekly, monthly and semi-yearly frequencies. As the medical profession attempts to prevent illness, when possible, instead of cure, so the Instrument Section here at Calco makes every effort to check, test, check again, each instrument. In that way, it is kept at its peak of accuracy in performance, preventing breakdowns and emergency accidents. Quotas have been established by the department for the checking of each type of instrument. Statistics reveal that when these quotas are met, or nearly met, the breakdown and repair jobs are less frequent. As a result, a cardinal guiding policy for the entire instrument crew is to keep abreast of the routine checking and testing schedules.

The mechanics in the Instrument Section are divided into crews, so that specialists in each type of instrument are assigned just to those instruments. For example, a group of men are assigned to thermometers. These men handle routine testing, as well as the installation and repair of thermometers. This division of work is not rigid and inflexible; rather, when the occasion warrants, men can be switched and transferred to other work to save time and to meet emergencies. Schedules are prearranged so that the required number of tests and checks are made for each instrument in the entire plant. It is necessary to schedule in tabular form the activities of each man every day. Each man, to meet emergencies, calls central headquarters every half hour to report on his progress and to inform the office of his location in case of emergency.

Training of Mechanics

There are four grades of men employed in the Instrument Section. First come the helpers. These are the green men who are being considered for further training as mechanics. If a man shows ability for this type of work, he is classified as a trainee, and given six months of training with a regular mechanic, as his helper. During this first six months of training, he works on installation and repair work primarily, under supervision. This same period covers some of the testing background as well, also under supervision. The next stage in the training of the mechanic is some six to twelve months as a junior mechanic, during which time he works on testing primarily. He forms part of the crew that goes around making the routine checks and tests of the instruments. To some extent, he is allowed to operate alone. When he has fully learned to test and calibrate all equipment in the plant and to install and repair, say, roughly, 50 per cent of the equipment, he is then qualified as a second-class mechanic. In the course of time as openings develop and he learns more of the business, he can become a first-class mechanic. His qualification in this category is that he can take care of any jobs in the plant that are placed before him.

The development of a group of mechanics for this type of work is vitally important. The work calls for a precise, accurate and an intelligent approach toward the job. Tremendous reliance is placed upon the accuracy of his work. Slip-shod methods in the Instrument Section cannot be tolerated. The expense of spoiled batches, the danger of injury to other employees, and the wasting of valuable time may easily result.

At Calco, instrumentation is considered to be an important operating function. Through the organization of instrument specialists in the Engineering Department and the creation of an Instrument Section of the Mechanical Department, every effort is made to obtain the greatest possible value from these delicate, sensitive devices. Thousands strong, these instruments guide, control and report on the smooth operation of Calco's chemical-producing tools and machinery.

Skilled instrument mechanics spend months at repair bench in the instrument shop to learn their heady craft.

Shipping and Container FORUM

By RwLahey

ICC SUGGESTS AMENDMENTS TO EXPLOSIVES TRANSPORTATION REGULATIONS—T. P. CALLAHAN RETIRES—OPM CONTROLS TIN SUPPLY—AMA ANNOUNCES DATE FOR 1942 TWELFTH PACKAGING CONFERENCE

THE I. C. C. has published several suggestions for amendment of the Regulations for the Transportation of Explosives and Other Dangerous Articles which it is proposed, be disposed of by modified procedure. Any party who desired to be heard upon any of the proposed amendments, was to advise the Commission in writing within 20 days from publication of this notice which was dated Jan. 19, 1942. The Commission may proceed to investigate and determine the matters involved in the applications, or may temporarily suspend action thereon, pending the next formal hearing on this docket.

The following proposals are of most interest:

(1) Commodity List. *Potassium nitrate mixed (fused) with sodium nitrite* is to be added to the list as an inflammable solid and it may be shipped in 103 W tank cars specially designed for this service.

•(2) Sec. 20. It is proposed that consignees must report promptly to the *Commission* all instances of improper staying and broken, leaking or defective containers of explosives or other dangerous articles in shipments received by them. (Present regulations specify that reports must be rendered to the Bureau of Explosives.)

It is further specified that the Commission will promptly report to the shipper, full particulars covering all such cases.

(3) Sec. 264 (0)(3) *Hydrofluoric acid* shipped in tank cars Spec. 105, 105A500, or ARA-V. This proposal states that tank cars should be equipped with special valves and appurtenances approved for this particular service. Filling density must not exceed 90% of the pounds water weight capacity of the tank.

(4) Sec. 272 (g)(1) Proposes authorization for shipment in *single trip drums of Sulfuric Acid* of 1.81 sp. gr. (65° Be) or greater strength or when strength is 60-65° Be, treated with inhibitor, rendering its corrosive effect on steel no greater than 66°Be commercial sulfuric acid. The specifications for this new single trip drum are numbered 17F.

(5) Sec. 303(j)(3) For the duration of the emergency, it is suggested that *I. C. C.-3A cylinders* may be charged with compressed gases other than liquefied or dissolved gases to a pressure 10% in excess of their marked service pressure. (Present regulations allow filling to service pressure only.)

(6) Sec. 303(q)(1) Note 3 proposes *limitations of filling densities* of *compressed gases* in tank cars such as anhydrous ammonia, hydrogen sulfide, carbon dioxide liquefied etc. These filling densities are slightly changed with proposed increases for shipments made during months of November to March inclusive, for the duration of the emergency only.

(7) Sec. 357(a)(11) This proposal adds the I. C. C. 22A or 22B plywood drums to the authorized list of containers for transportation *of cyanides*. This will allow the packing of 200 lbs. net per drum.

(8) Shipping Container Spec. 15A *covering nailed boxes* not cleated, (style 1) single cleated boxes, (style 4) and double cleated boxes (style 2). It is proposed that the loading capacities be increased for these boxes when containers are constructed of "Group II" woods.

(9) Shipping Specification 17F is the proposed *single trip drum for transporting sulfuric acid* noted in No. 4 above. This drum is to be constructed of 16 ga. steel with 11 ga. or heavier chime reinforcements and to be of 55 gals. capacity only. Expanded rolling hoops are authorized with extra corrugations between hooks and chimes required. Heads must be crowned to a minimum of 3/4" and chime height must be 1 1/4". One opening of not over 2.3" diameter and one opening of not over 3/4" diameter are authorized, both openings to be placed in one head only. Openings are to be welded and threads are to be standard pipe thread. The drop and hydrostatic tests are to be the same as prescribed for I. C. C. 5A drums which are 6 ft. drop filled with water onto solid concrete and an 80 lb. per sq. in. hydrostatic test maintained for 5 minutes.

(10) *Tank Car Specification 103A.* It is proposed that *safety vents equipped with lead discs* having 1/8" breather holes in center thereof be authorized experimentally for use in cars containing sulfuric acid, oleum, mixed acid, and other fuming acids.

(11) *Tank Car Specifications 103B.* It is also proposed that the same *lead discs in No. 10* above be authorized experimentally for use in tank cars containing hydrochloric acid 20°Be. and weaker and for other authorized fuming acids.

T. P. Callahan of Monsanto, Retires

Thomas P. Callahan, the well known container and packaging specialist of the Merrimac Division of Monsanto Chemical Co., retired Jan. 1 after 41 years of service with that organization.

THOMAS P. CALLAHAN

Mr. Callahan has been an active participant in the work of the Technical Committees of the Manufacturing Chemists Association since they were organized. In 1915, Colonel Dunn, then Chief Inspector of the Bureau of Explosives, called on the chemical industry for men to aid him in developing a safe and suitable tank car for the transportation of muriatic acid. This was later followed by the formation of a carboy committee, organized to combat the heavy package and damage losses suffered by the railroads at that time. Mr. Callahan was the Merrimac Chemical Co.'s representative on these committees and the successful results were in no small measure, due to his efforts. He was also chairman of the special committee which developed the M. C. A. Standard Carboy Bottle. (13 gallon capacity.)

Other committees followed, which were ultimately to cover all packaging and safe practice in transportation in the chemical field. Mr. Callahan's wide experience and zeal were large factors in the success of these committees. Under his chairmanship for the past fifteen years, the Metal Bar-

rels and Drums Committee has accomplished an outstanding service. He was also a member of the Carboy, the Poisonous Articles & Miscellaneous Packages, the Tank Car, and the Standardization Committees of the Association.

In Mr. Callahan's resignation, the industry suffers a great loss. His place will be difficult to fill. The goodwill and affection of all his associates go with him in his well earned retirement.

General Box Co. Issues Pamphlet

General Box Co., Chicago, has issued a pamphlet illustrating many uses of the wire bound box. It gives evidence of how engineered containers are helping manufacturers conserve man-hours, break shipping room bottlenecks, reduce shipping charges, eliminate loss and damage claims, and often lower the original container cost.

OPM Controls Tin Supply

The Federal Government has taken charge of all supplies of tin in the United States and all tin afloat.

General Preference Order M-43, provides that:

1. All supplies of tin shall be subject to specific allocation by the Director of Priorities and the purposes for which tin is used shall also be specified.
2. No tin may be sold or delivered without specific permission of the Director of Priorities.
3. Future imports of tin may not be sold except to the Metals Reserve Company or other governmental agency.
4. Tin now afloat may not be sold except by special permission of the Director of Priorities.

The only exception to the order is that a distributor may deliver to his regular customers less than 5-ton lots of tin, subject to Priorities Regulation No. 1.

Inventory provisions of Regulation No. 1 will be invoked and no deliveries of tin or tin products will be made to fabricators who have ample stocks on hand.

Purpose of the order is to conserve existing supplies of tin, which is used largely in the canning of food. Practically all our tin comes from Malaya and the Netherlands Indies.

Approximately a year's supply of tin, at normal demand levels, now is on hand in the United States. Careful conservation is expected to make this supply stretch through any possible emergency period. A conservation order, limiting the uses of tin and the uses of tin-lined cans, will be issued within the next few days it was announced.

The United States consumes more than 100,000 tons of tin a year and produces practically none. Bolivian ores to be refined in a new smelter now under construction in Texas cannot supply more than a third of our normal requirements.

According to tin experts in the Office of Production Management, de-tinning of cans is an expensive process, but salvage operations in that field may be necessary.

AMA Announces Date for 1942 Packaging Conference

The most urgent of packaging problems —that of efficiently utilizing existing materials and developing substitutes for restricted materials—will be authoritatively and exhaustively examined at the Twelfth Packaging Conference to be held at the Hotel Astor, New York City, April 14 to 17, it is announced by the American Management Association, sponsoring organization for the Conference.

At the Packaging Exposition, held concurrently with the Conference, the most recent advances in substitute materials and in techniques for packaging, packing and shipping, will be presented by leading suppliers of equipment, materials and machinery.

The pattern of probable availability of the various raw materials required in packaging, packing and shipping is becoming clear. Adaptation to this pattern is finding expression in simplification, standardization, reuse and reclamation. Along these lines, as in the case of substitutes, the ingenuity and aggressiveness that have always characterized the young art of packaging are impressively being asserted.

Some of the developments in these directions—particularly in the employment of substitute materials—will be shown for the first time at the Packaging Exposition. Many of these have considerable technical significance and promise to influence the packaging art profoundly.

O. P. M. Urges Simplification of Glass Bottle Sizes and Shapes

Lessing J. Rosenwald, chief of the Bureau of Industrial Conservation of OPM, has appealed to glass-container manufacturers, packers, bottlers and other users of glass containers to conserve raw materials essential to war production by simplifying bottle sizes, shapes and finishes wherever possible.

A widespread and effective simplification program would reduce the variety of sizes and designs now in use, Mr. Rosenwald pointed out, which in turn would permit more efficient use of man-power, fuel, and equipment, as well as achieve important savings of critical materials. Such a program should also include the use of a greater proportion of larger size containers it was recommended. Scarcity of soda ash and other chemicals used in the glass-container industry, the bureau chief emphasized, necessitates the utmost economy and efficiency in the consumption of these materials.

It was also explained that iron used for molds can be conserved through greater utilization of existing mold equipment and by the elimination of fancy designs which require greater quantities of iron than conventional designs. Paper used for shipping cases required in vastly increased quantities in the war effort, will also be saved through such conservation methods, Mr. Rosenwald said.

Hinde & Dauch Paper Company Issues Sealing Booklet

As a guide to manufacturers in all fields who seek to save time, money and materials in shipping the Hinde & Dauch Paper Co., Sandusky, O., has condensed authoritative information on sealing methods into a handy little booklet.

Based on H & D's own experience in sealing all the types of shipping boxes "How to Seal" points out where and why principles of simplification can be applied to sealing operations to help conserve materials, man-hours and money.

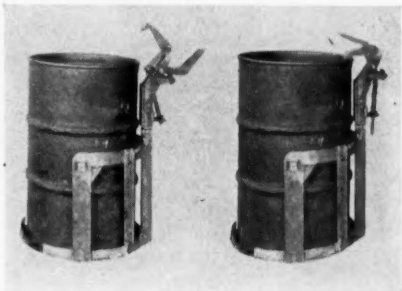
The most efficient methods for sealing with adhesives, gummed tape, staples or stitches, and wires or straps are presented in a concise style.

Copies of "How To Seal," No. 1 of a "practical packaging information" series to be published as H & D's Little Packaging Library, may be had without cost by writing The Hinde & Dauch Paper Company, Sandusky, Ohio.

Toggle Type Barrel Harness

Lewis-Shepard presents a new, quick-locking harness to speed up and make more efficient the handling and dumping of barrels and drums.

Now it is possible to place a drum in the harness direct. A standard type of Lewis-Shepard barrel hoop truck deposits the drum directly into the harness. Thus



the drum does not have to be placed on the floor first as formerly.

The harness is equipped with a spring toggle, is arc-welded throughout, and can be made for any size drum.

Plants which have considerable handling and dumping operations using barrels or drums will find this new, quick-locking, toggle-type, barrel dumping harness of great assistance in speeding up their work.

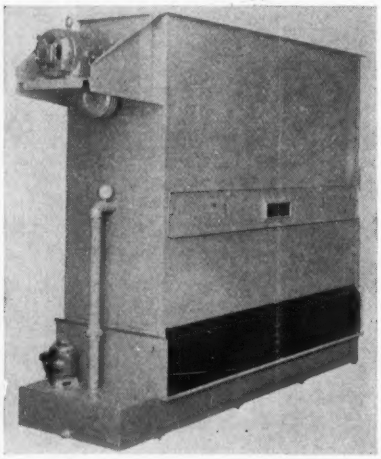
They report that this device used in conjunction with their Master Dumping Stacker No. 7410 and their Barrel and Hoop Truck provides a new three way system—the most modern drum handling and dumping system on the market.

New Equipment

Evaporative Cooler QC 157

The Niagara Blower Company has announced the production of a new evaporative type unit for removing heat from various industrial liquids, quenching baths, jacket water, oils, hydraulic fluids, oil lubricating systems, soap and other solutions, chemicals and coolants for various purposes.

The new unit consists of a casing containing tubes through which the hot liquid passes. A spray system drenches the tubes constantly with circulated water and air is drawn through the sprayed coils by a fan, applying the principle of evaporative cooling. It is claimed that only the water evaporated is consumed, saving 95 per cent of the water ordinarily used with shell and tube heat exchangers.



In addition, provision is made for bypassing the air, controlled by thermostat operated dampers, maintaining a constant liquid temperature. Provision is also made for a heating coil in the liquid tank, for pre-heating solutions as required for controlled temperature quenching baths, preventing freezing in winter and preventing the separation of high melting point fats from solution.

New Line of Strainers QC 158

Supplementing its regular line of pumps and accessories, the Blackmer Pump Company has recently put on the market a series of strainers for pipe sizes from 1 to 6 inches.

The new Blackmer strainers will be known as the "Ezy-Kleen" line, and while they were designed primarily for use with Blackmer rotary pumps, they are suited to applications with other types of pumps, or wherever a strainer is required in a piping layout.

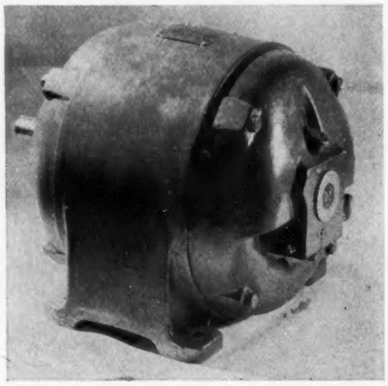
The basic design follows that of the standard "basket type strainer." The bodies are made of iron as standard, and are available in bronze. Steam-jacketed bodies are also furnished. The baskets are made of steel or brass woven wire cloth in fine, medium or coarse mesh, and are well reinforced. A handle is provided for removing the basket from the strainer body for cleaning. The body cover is held in place by special thumb screws, no wrench being needed to remove it for cleaning.

"Ezy-Kleen" strainers are rated on a basis of flow in GPM and are furnished in five sizes from 50 GPM to 700 GPM. The 50 GPM strainer has tapped connections; the larger sizes have flanged connections. All are made in several standard sizes.

The standard constructions are suitable for operating pressures up to 50 psi. and for temperatures up to 275° F. Strainers for higher pressures and temperatures are furnished on special order.

Protected Motor QC 159

Allis-Chalmers claims a major improvement in "safety-circle" protection of its new Lo-Maintenance motors. Developed to give the motor all-around protection, the "Safety Circle" is a wide, solid rib—integrally cast as part of the frame—which forms an unbroken circle around the stator.



A more liberal rise of electrical materials is said to make this motor internally and electrically stronger because current and magnetic densities are less extreme. Improved bearing design delivers smoother performance with full-flow lubrication and easier maintenance. Additional cross strength has been built into the distortionless stator for maximum power efficiency.

Foamite Mixing Chamber QC 160

A new "Evertite" chamber has been designed for easy installation on modern oil storage tanks of the pressure type, it is announced by the manufacturer, American-LaFrance-Foamite Corporation.

The mixing chamber derives its name "Evertite" from the fact that an inspection cap can be removed, and a sealing diaphragm inspected, without releasing tank pressure.

The vapor-proof glass diaphragm is so installed as to prevent vapors in oil storage tanks from entering the body of the mixing chamber, from entering and condensing in chemical solution lines, or from escaping to the air when bottom or top plate, or inspection cap, are removed. The diaphragm, glazed in a metal frame, holds gas tank pressure, yet ruptures fully under foam pressure at time of fire, allowing free access of foam blanket to burning surface. Diaphragms are readily replaced. Frame may be unbolted and removed to work bench for new glass, or extra complete diaphragms may be carried in stock, ready for immediate installation.

A separate adapter flange is provided for mounting over foam opening in oil tank shell. Flange surface adjoining tank shell is concave to fit curvature of tank. The outer flange face is flat, to make up to the outlet flange of the mixing chamber. The adapter flange may be fitted to oil tank during fabrication, and blanked off pending later chamber installation, if desired. The adapter flange is furnished with studs for bolting in place. A foam deflector plate is in two sections, each with two supporting struts.

The chamber is of expansion type design, with increasing cross-sectional area to ensure intimate mixing of chemical solutions, efficient formation of foam, and low velocity delivery. Solution inlets at bottom of chamber impinge within a baffle, assuring a thorough mixing. A small hole in bottom plate allows air to circulate within chamber, retarding corrosion; provides drainage; acts as telltale upon foam discharge. Top and bottom plates may be removed periodically for painting interior. There is ample clearance between body of chamber and tank shell for outside painting. The body is of sheet steel. The throat is a heavy steel casting, welded to the body.

Hardsteel Drill QC 161

The Black Drill Company has announced a new type of drill which will cut hardened steel of any type, temper or analysis. It is said that this tool, known as the "Hardsteel" drill, has been used successfully on carburized, oil hardened, water hardened, cyanided and nitrided pieces of high carbon, high chrome, and high speed drills of various degrees of hardness.

Chemical Industries
522 Fifth Ave., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 157 QC 158 QC 159 QC 160 QC 161

Name ....

Title .... **Company** ....

Address ....

CHEMICAL SPECIALTIES

Higgins Ink Co. recently introduced new bottles for its half-pint, pint and quart sizes of American India Ink. Improved labeling, sure-grip lines, foolproof pouring, package family tie-in and shoulder treatment are some of the features. Former containers are in background.

Industrial **Agricultural** **Household**

HOLLINGSHEAD . . .

Specialist in Specialties

Above left, automatic can filling machine, capacity 24,000 per day. Directly above, loading freight cars from interior loading platform, Hollingshead plant.

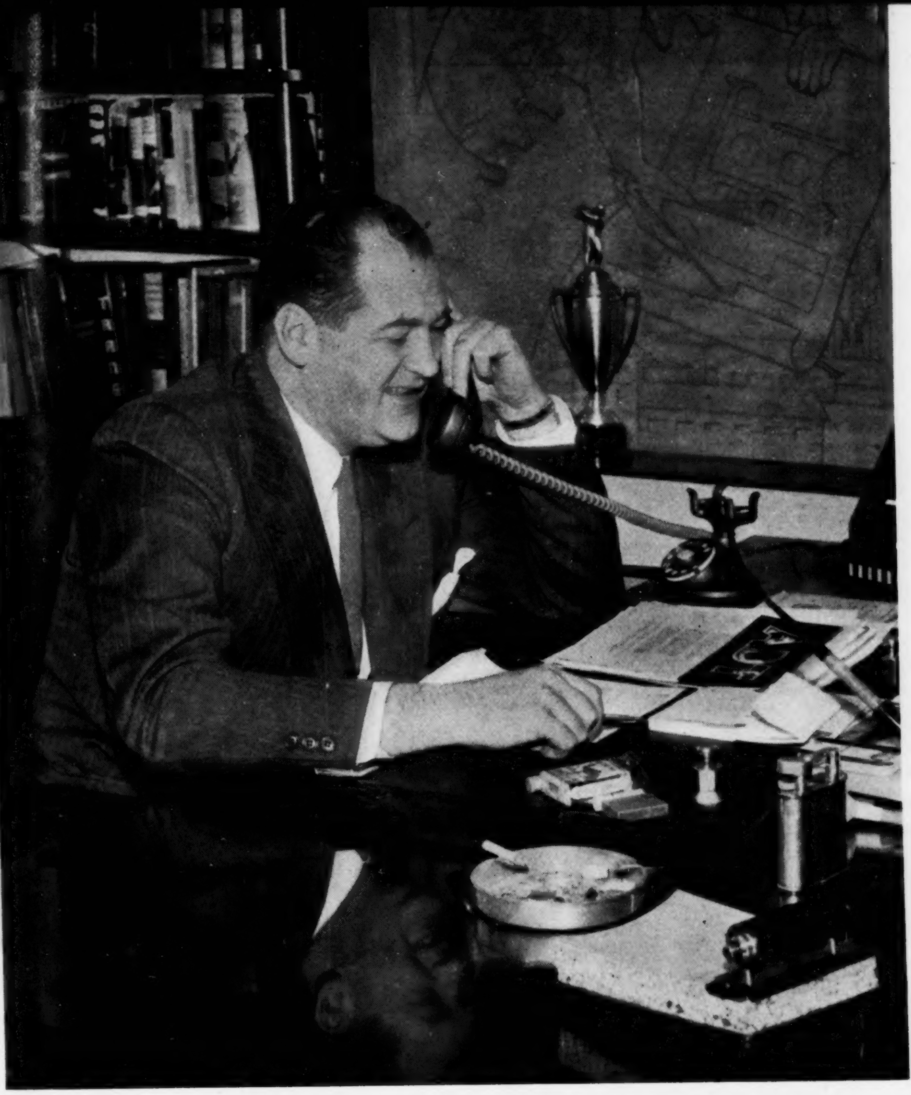
By James M. Crowe and Paul Slawter
Assistant Editors

Maker of chemical specialties right from the bare sheet of tin up, the Hollingshead Corporation produces over 500 active formulas and 5,000 different items. Here is the story.

"NEITHER snow nor rain nor heat nor gloom of night stays these couriers from the swift completion of their appointed rounds." The famous creed of the post office, at least that part relating to snow and ice, was vividly recalled by your technical reporters one day last month as we sallied forth to visit the plant of the R. M. Hollingshead Corporation in Camden, N. J.

The Hollingshead organization, we learned a few minutes after we had thawed out physically and mentally amid the pleasant surroundings of Mr. A. E. Moore's offices, started 55 years ago to manufacture harness soap and now pro-

Cooking kettle in the mixing room (at the left).



R. M. Hollingshead, Jr., vice-president in charge of manufacture.

duces over 500 active formulas which, in different brands and sizes go into approximately 5,000 items. This, our editor had explained, had all the necessary background of a good story. He was right.

Before starting us on our inspection trip Mr. Moore, who is assistant to Mr. R. M. Hollingshead, Jr., vice-president in charge of manufacture provided us with identification badges and told us a little about the company. Soon after the business was started, he said, the company began making carriage top dressing, axle grease and brass polish. In 1909 when the automobile business started to grow up, it put out auto top dressing, auto polishes and greases. In 1920 it went into the household field began to put out floor waxes, furniture polish, glass cleaner, silver polish, drain solvents and other such things for the home. In 1920, an industrial line of insecticides, disinfectants and germicides was introduced.

There are now about 700 employees in the Hollingshead organization, Mr. Moore told us, and the company is headed by R. M. Hollingshead, Sr., who is its founder. The employment figure is a high one, he pointed out, because the company at present has a large percentage of its production geared to defense work and this has called for more help. "However, if you're going to write that down," he said, "we prefer to call it *offense* work around here. High time the country got away from the defense idea and down to some serious business."

The other officers of the company, Mr. Moore told us, are: R. M. Bagley, executive vice-president; Stewart Hollingshead, vice-president and sales manager; and R. M. Hollingshead, Jr., vice-president in charge of manufacture. The latter officer, he said, would talk to us after we had inspected the plant.

We asked Mr. Moore to tell us a little about the fire which the Hollingshead plant had suffered about a year ago. "Yes," he said, "that was a bad one. It happened in July, 1940, and it completely destroyed our main plant. You can see where it used to be from this window. The company owned the land and group of buildings which contain our new plant, and we lost no time in getting right back into production. Plans were drawn up, the work was begun in what seems like no time at all and you can see the results of a year-and-a-half of hard work." The new plant provided the opportunity to make a lot of improvements in the company's manufacturing methods. In short, the plant was streamlined from basement to roof. It was a record-breaking job.

The Hollingshead corporation, Mr. Moore went on, is probably the only company in the country which puts out chemical specialties from the bare sheet of tin up. In other words the company (1) makes the container, (2) lithographs the container, (3) mixes the product, (4) cans the product, and (5) sells it. The plant is fitted with the latest equipment in each of these departments for the greatest efficiency of output and quality of product. Even the sales organization he said, is streamlined.

Most famous, perhaps, of all the Hollingshead products is the Whiz line which includes everything from automobile necessities to floor waxes and fabric cleaners. For the government's victory program Hollingshead is producing such things as lubricating oils for aircraft engines, hydraulic brake fluids, fire extinguisher fluids, insecticides, sperm oil, rust preventives, shell containers, caps for howitzer shell containers, greases, paint remover, ice preventive for airplane windshields, thread compound, etc.

Many Different Products

Looking over some of Hollingshead's other products, which they make to sell for their own account or for other companies who sell under their own names, you can find such things as: floor waxes, linoleum paste, oils, soap, rug shampoos, gear lubricants, greases, rubber tire coating, dry cleaner, auto polish, insecticides, rust preventives, and other similar specialty products.

By the time we had learned all this about the company, Mr. Moore thought we were ready to see the plant. We went through his office, which is on the second floor, into the plant. In order to show you the complete setup, Mr. Moore said, we'll start on the top floor (the fifth) and work down. As we went through the plant to the stairway he pointed out the railroad siding from which the company takes its shipments. The plant has been designed so that the railroad track goes right through the main floor, facilitating unloading. We saw storage tanks in the yards for raw materials from the tank cars such as caustic soda, etc. On the main floor there were cases of tin coated sheets for cans. The tin is allotted on this floor according to each order and is not sent upstairs to the lithograph, shearing and cutting rooms until it is actually requisitioned for a customer. After we took some photographs Mr. Moore showed us their methods of warehousing the tin.

We climbed up to the fifth floor where the lithography is done. In case you don't know it, this means where the tin cans are printed. We saw how they print the cans on the flat sheets of tin, printing

General view of control and analytical laboratory.

as many as possible on each sheet. We saw machines at work on the primary coats of color in preparation for the lithography. We saw other machines putting on the first, second and third colors on the tin sheets. There were labels for containers of automobile polishes, floor waxes, tire tube kits, metal polish, etc. We saw preliminary work on cans for government use—these are simply black lithographs on the base coat; no other color is used for the government's orders.

On the fourth floor we went into the shear room where the lithographed sheets for the cans are cut. We saw much work for the government going on here—shell containers and caps for howitzer shells for the army. The noise was terrific. We asked Mr. Moore what quantities of orders they had for government work but he said he couldn't tell us except that the items totalled millions of cans. On this floor we also saw the punch press at work and visited what Mr. Moore called the "dope" room. This department's function is to put a rim of rubber around the inside of can joints to prevent leakage.

Next we visited the actual can-making room where everything was going full blast. There were myriads of machines which were putting together cans of a number of shapes and descriptions. There were gallon cans for floor wax being made on one machine while the equipment next to it was turning out something like you'd use for spot remover. One machine, the company's own development, was forming cans and soldering all in one operation. At another part of the room we saw a machine turning out gallon cans. "Notice the operation where the can flips over after it is joined at the seam," said Mr. Moore. "We used to have a girl standing there to do that operation. One day one of our engineers sat there watching the machine and he figured out a way to do it mechanically. So we built an addition to the machine and moved the girl to another part of the shop. It's all automatic now."

One piece of equipment which fascinated both of us was a windmill sort of affair which was "going like sixty." We were told that it was a leak testing machine and that it worked on a principle of air pressure. Formerly they had a liquid tester for the finished cans but the method wasn't always fool-proof and this machine had been found much more efficient. The liquid tester was much slower and less efficient as the operator had to watch for air bubbles in the bath as the cans were passed through. The chances of missing leaks were quite probable and the cans had to be dried. The drying operation took considerable time and still did not insure complete freedom from rusting.

With the new testing method, however, air pressure can be applied to the cans and leaks indicated on a sensitive gauge. This meant no dependence on the bubble-watching art of the operator, elimination of the drying operation and freedom from the possibility of rusting. There was some more government work being put out here.

On the third floor we went through a storeroom which housed more specialty articles than we had ever dreamed existed. "When you think of it, all in all, counting the different brands and sizes," said Mr. Moore, "we probably put out about 5,000 separate items." We agreed with him that that was a lot of items. They all seemed to be represented in this storeroom.

A big problem existing here is inventory control. It must be possible quickly and economically to locate finished products and make withdrawals with the least possible shifting of stock. We could see that the company took pride in its handling of this problem. Mr. Moore showed us how they are taking care of increased traffic, occasioned by government orders, by the rearrangement of several bays and new passages made by knocking several large doors in the partitions of adjoining storage rooms.

We next found ourselves in the filling department where the same fervent activity which seemed to characterize the whole plant was noticeable. We saw many types of filling machines. Mr. Moore explained that one type was the Pneumatic Straight Line Filler of which they have several. He showed us Automatic Samco Fillers and pointed out numbered pipe lines over each filling machine which indicate the tank or mixing kettle to whch the machine is connected. We counted four automatic Samco fillers, four straight line fillers,

three four-head cappers and one two-head capper. Filled and capped cans flow from each production line at the rate of 50 to 120 containers a minute, Mr. Moore said. We asked about one machine in particular and Mr. Moore said that it would fill and cap and pack into cases 120 pint cans of auto polish a minute. Another interesting feature, he said, is the synthetic rubber hose used on all the filling machines—it's all neoprene. In discussing the use of synthetic rubber Mr. Moore made the interesting observation that a great many applications could still be filled here by the use of materials having the properties of certain synthetic rubbers or rubberlike materials. It is difficult to get these materials now and the price has been comparatively high. But if the United States builds up a synthetic rubber industry which will insure large supplies at low cost after the war is over, industry may be expected to make greater use of the commodity.

From this department, which is on the ground floor we went out into the tank field and looked into the foamite house which covers the outside storage tanks. Mr. Moore explained the importance of modern fire and hazard control and pointed out to us the advisability of placing control in a protected area. In the foamite house pumps and lines are installed which connect to all storage tanks above ground, which will supply fire choking material to any individual tank or group of tanks.

Next to Pump House

We then visited the pump house. These pumps supply the medium which is used both to empty the tankcars and to fill the mixing vats in all mixing departments. Each pump is permanently connected to a certain storage tank so that it always handles the same material and prevents any contamination. The motors which drive the pumps are of various horsepower depending on the specific gravity and viscosity of the material and the head to be pumped against.

The starting switches and other controlling apparatus for the pumps are housed in a separate building nearby to insure safety.

We went from the yard up to the second floor to see the mixing tanks. Mr. Moore seemed especially proud of these tanks which he said hold 2,500 gallons and are steam jacketed and adapted for all classes of cooking and blending. Each tank has its own permanently top-mounted motor for the mixing operation, quite unlike the old plant which Mr. Moore described as a mass of overhead pulleys, belts, shafts and wheels, all connected to a central source of power. By the complete installation of these independent motor-driven mixers the efficiency of the mixing room has greatly increased and much horsepower saved. One mixer had a batch of insecticides in it and we remembered that when we were in the filling department on the floor below they were filling cans for government use with this material. We asked Mr. Moore about this and he said that the vat we were looking at was directly above the filling machinery we had seen in operation. Overhead pipes ine this department are numbered and connected to the outside pumps mentioned above. By using this system of numbers there is no danger of mixups and misdirected power.

Filling Is Easy

Filling the mixing vats for simple blending operations is an easy job. The operator simply sets a meter for the number of gallons wanted, calls the pump house for power in his direction and they let fly. "You see why we're so proud of our new plant," said Mr. Moore, "everything's designed according to the latest scientific principles."

Our next stop was the research laboratories and control laboratory and it was in this department that Mr. Moore's eyes really began to shine. He told us the reason for it later—up to six months ago he had been connected with this department and the Mixing Department as Assistant Chief Chemist, then he went into the main office as assistant to the vice-president in charge of manufacture.

The laboratories have the latest equipment obtainable. There is an individual laboratory for each chemist and his assistant. Each laboratory is complete in itself and each chemist is assigned a different group of products to work on. This makes the department a host of specialists and according to Mr. Moore the plan is a wise one. With less distraction and more opportunity for individual research the company has found that its actual work accomplished in the laboratories is better than it was when the work was centralized in one room. In one laboratory a chemist was working on a white rubber tire paint—a big item with Hollingshead. He showed us how, by using a rubber base, the chemists had developed a tire paint which would not chip off like ordinary paint when subjected to the rigors of wear and weather.

Right, top to bottom, mixing tanks for hot and cold mixtures; control laboratory for mineral ore tests, etc.; vacuum filling machine which automatically fills, caps and cases cans at speeds up to 150 per minute; litho press in operation; A. E. Moore (left), assistant to the vice-president in charge of manufacture, and Dr. T. J. Bagley, director of research for the corporation.

We went into one laboratory which is set aside for government inspection work. Since the plant is doing much for the government's war program, it is natural that government and army inspectors spend a great deal of time at the laboratory seeing that all Navy, Army and Air Corps specifications are lived up to. Mr. Moore told us that as many as eight inspectors have used the laboratory at one time for their tests.

Insecticide Laboratory

Going further we visited the laboratory for insecticides, cleaners and polishes. We took some more photographs as we went along. Then we got to the control laboratory whose duties include the testing of all raw material used in manufacturing and the testing of every batch of the various products made by the company. No products are filled into cans until approved by the control laboratory. While there we noticed a government mixing order on the table. It was for 17,000 pounds of a certain number product. It had the government's specifications on it. And under the item marked *date required* was written . . . PROMPT and "Remember Pearl Harbor!" In another spot we saw a can of liquid cement for tent patches which was being tested for government use.

We talked to T. J. Bagley, director of the laboratories, who told us of the work that his department was doing. We asked him whether he considered research an important factor in the success of the company. It wasn't quite a fair question to ask of a research director, but since we later got the same answer from the vice-president in charge of manufacture, his answer must be a good one. "I not only consider it an important factor," he said, "I consider it entirely responsible for the success of this company." He told us some of the early history of the company to show just how he could back up his statement. When they first started, he pointed out, the company was a manufacturer of harness soap. Next came the production of such things as varnish preparations, inks and carriage top dressings—none of which products the company makes now. He told us a funny story about carriage top dressing. When the automobile first came into production they had to change the name of the product to Carriage and Auto Top Dressing. Then as the automobile gradually began to replace the carriage they had to change the name to Auto and Carriage Top Dressing. Later they dropped the Carriage part of the name entirely and it became simply Auto Top Dressing. It was the company's awareness to change which kept them going and growing, he said. Each time a new field seemed to be open to the company's facilities, it did research work and began production in that field. He cited the household specialty market, the insecticide market, the lubricating oil market, and the increasing uses for vegetable oils and waxes.

We asked Dr. Bagley about the department's present research job. Dr. Bagley told us about their work in finding substitutes for the products which we have been out of because of war. He said they were doing work on substitutes for vegetable oils, waxes, gums, fossil gums, solvents, etc.

He cited the value of new products made available by the chemical industry and how they made possible more and better formulations. This research on new products and formulation was given much credit for more efficient processes in the large-scale manufacturing operations. The staff is twice the size it was before the new laboratory was built.

Research Divided

The research department is divided up in sections for research on petroleum products and oils, drugs and pharmaceuticals, insecticides and disinfectants, polishes and waxes and analysis and control The two mixing departments also are headed by chemists who have laboratories under their control also. In all there are eight laboratories. Soon, Dr. Bagley said, the company is planning to install a tel-autograph system which will make the work of the entire setup even more efficient. We also found out in talking to Dr. Bagley that he had been with the company since 1909—ever since he got out of Drexel Institute in Philadelphia. Mr. Moore, he told us, had been with the company since 1922. It turned out later that a great many of the firm's employees are old-timers.

Dr. Bagley went on to tell us more about the company's dependence upon its research departments. "Now, more than ever," he said, "we are constantly changing formulas on account of shortages of raw materials. The Government specifications are rigid and must be lived up to. Our methods of manufacture have changed, too. This all takes research. One grease, for instance, used to call for days of mixing. Now we make it up in four hours. We don't expect to discontinue the manufacture of any products, but that all depends upon the length of the war. Our equipment is sufficient for almost any sort of test—it has to be if a company ever expects to get anywhere."

He told us that by using the latest equipment, both in laboratory and in facory, they had lessened the cost of manufacture considerably. One mixing tank, he said, used to call for about 30 horsepower in the mixing operation. Now it is equipped with two speeds which call for two or five horsepower.

Our discussion next turned to talk of the war since Dr. Bagley had mentioned it. Mr. Moore said that if we were to talk to his boss we had better be getting around to it before it was too late. We thanked Dr. Bagley for his help and went back to the main office to see R. M. Hollingshead, Jr., vice-president in charge of manufacture.

Need Quintupled Research

We asked Mr. Hollingshead the same question about research that we had put to Dr. Bagley. Mr. Hollingshead answered by saying that he thought his company ought to be doing five times the research it is doing now. Asked why it wasn't he said that you cannot get the trained personnel to man the laboratories now. He gave two reasons for his contention about research: (1) because we must develop substitutes for present scarce materials and (2) because we must prepare for after-war production. The company which does the best job of preparation for the after-war market will get it, he said. We talked a great deal about what was likely to happen after the war, during the war and what had happened before the war. Mr. Hollingshead told us a great many things about his company which we had picked up on our tour. He said that his company probably was the largest single supplier of automobile specialties in the country. He told us about the company's Canadian branch which supplies that country with the same products made in the U. S. The Canadian branch, he said, does not make cans, however, it just fills the containers sent by the Camden plant.

As we approached the end of our interview, Mr. Hollingshead told us of his admiration for the chemical industry and the faith that he had in it. "The chemical industry," he said, "is the finest industry in the world. It has more possibilities than any other industry. Every development of major importance will probably be chemical in nature." We said we are of the opinion that the world is now in the chemical age having left the mechanical age at the beginning of this war. "You're absolutely right," said Mr. Hollingshead, "from now on, the mechanical age will simply be a tool with which the chemical age will go forward."

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

A great proportion of this specialty manufacturer's plant output is now going into the U. S. war program.

CHEMICAL SPECIALTY News!

Gulick Calls for Far-Sighted Policy—NAIDM Selects Hershey as Place for Summer Meeting, June 8 and 9—Preparations Are Being Made for 1942 Official Test Insecticide—Sixth Annual Pest Control Operators Conference Is Held at Purdue University

DESCRIBING every strike now as a gift to Hitler, Charles P. Gulick, president and chairman of the board of National Oil Products Co., Harrison, N. J., called for a far-sighted national labor policy that is fair to all and founded on the right to work and the right to employ, in his January letter to employees, entitled "Strikes and National Defense."

"The right to strike must not be used to destroy the right to work or the right to employ," Mr. Gulick said. "It should be illegal to call a strike (1) unless more than half of the workers affected vote for it by secret ballot properly supervised; (2) when there is no dispute with the employer—the so-called sympathetic strike; (3) to settle a dispute between rival unions; (4) to bring about a closed shop or any other form of labor contract leading to a union monopoly of employment.

"It is recognized, of course, that individuals have just as much right to join together into unions for their mutual benefit as they have to join together in corporations" Mr. Gulick continued. "But no organization, labor union or corporation, should exercise power without corresponding responsibility.

"The welfare of the employee, the employer, and the public at large, requires that labor unions as well as corporations be legally responsible and fully accountable for their actions and those of their agents. This would weed out labor racketeers and thus protect the public, the individual laborer, and the well-run union."

NAIDM Selects Hershey

Summer meeting of the National Association of Insecticide & Disinfectant Manufacturers, Inc., will be held at the Hotel Hershey, Hershey, Pa. The place of this 1942 meeting was selected by a recent mail vote. June 8 and 9 are tentatively set aside as the dates.

Hershey is about 14 miles east of Harrisburg, Pa. Hotel rates, American plan, will be $9 per day per person for two in a room and $11 per day per person for single rooms. No charge is made for garage or use of swimming pool and other facilities.

Cleveland came out second in the voting for the Summer meeting place.

Get Your Test Insecticide

Arrangements are now being made for the preparation of the 1942 Official Test Insecticide which will become official on June 1, 1942 to June 1, 1943.

Members of the National Association of Insecticide and Disinfectant Manufacturers are urged to anticipate their requirements over the next four months for the current 1941 O. T. I. and arrange to purchase as soon as possible.

The supply of the 1941 O. T. I. is not large and it is desired that all requirements of members shall be taken care of prior to increased Spring demand from outside firms and laboratories. If present stocks of 1941 O. T. I. are exhausted before June 1st it will necessitate borrowing from other laboratories in the trade.

PCO Conference at Purdue

Sixth annual pest control operators conference was held at Lafayette, Ind., Jan. 5 to 9 under the sponsorship of Purdue University in cooperation with the National Pest Control Association. Registered at the conference were 119 participants from 21 states and Canada.

J. J. Davis, Chief in Entomology, Purdue University, opened the conference program, some of which follows:

Words of Welcome, Dean H. J. Reed; Insect Morphology and Physiology, B. E. Montgomery; Insect Reproduction and Development, H. O. Deay; Principles of Insect Control, J. J. Davis.

Afternoon session. Presiding—George E. Gould. Classification and Identification of Insects, With Special Reference to Those Occurring in Homes—H. O. Deay.

Group B. Presiding—Morton S. Prescott. Bio-Assay Tests, G. C. Oderkirk; Rat Campaigns, Albert M. Akers; Baits for Rats and Mice, G. C. Oderkirk.

Tuesday morning session. Presiding—Glen E. Lehker. Demonstration: Testing Sprays for Fly Control, E. N. Woodbury; Mosquitoes: Common Species, Habitats, Relation to Disease, and Their Control, I. C. Brooks; The Relation and Importance of Arthropods to Disease, R. M. Cable; The Pest Control Operator Under War Conditions, R. E. Herod; Disinfectants and Deodorants, Martin Meyer.

Tuesday afternoon. Presiding—J. Harvey Sturgeon. Important Points in the Life History and Control of the Termite, G. E. Lehker; How to Inspect a Building for Termites, H. K. Steckel; Treatments for Termite Control, R. A. St. George; Inspection of Termite Infested Building Field Trip in charge of Walter S. Gibson.

Tuesday evening. Presiding—W. O. Buettner. Structural Terms, K. H. Kettelhut; Discussion of Termite Inspection Trip—Leader, Robt. C. Yeager.

Wednesday morning. Presiding—H. O. Deay. Industry Problems: With Special Reference to Research, Public Relations, Priorities and National Defense, W. O. Buettner; Demonstration of Grinding and Mixing Dry Chemicals, Bert Lewis; Methods of Applying Insecticides, A. G. Grady; Applying Insecticides as Aerosols, W. E. McCauley; Substitutes and Improved Chemicals, Geo. L. Hockenyos.

Pest Control Operators Meet at Purdue

Group photograph taken in front of the Agricultural Building, Purdue University, at the recent Pest Control Operators' Conference.

Between the Lines

Ethyl alcohol, important to this nation's military effort, raises a problem in the sugar industry which is supplying much of the raw material. Here is the situation.

CONGRESS and the Administration, acting in inverse order, have taken the brakes off of this nation's military efforts in all its branches—the limit is set only by what can be accomplished. An Army conceived in terms of definite numbers of men, around 2,000,000, no longer is contemplated in static terms—it may attain seven million or 10 million.

An Army shoots, or at least this one is intended to; and to shoot requires powder—smokeless powder, which in turn requires ethyl alcohol to produce. Accordingly the quantity of ethyl alcohol needed today is geared to the size of the Army that will shoot the powder up, which means that so far as certain Army branches are concerned, such quantity is today a military secret. Informally however, it has been mentioned as between 275,000,000 and 300 million gallons for all purposes, annually.

If all were produced from sugar this quantity of alcohol in production would soon ease a peace-time headache of several Federal agencies—how to keep surplus sugar off the market. The efforts to do so in the past, are instead today's worry, and with factors arising since the Pacific war, may mean that ethyl alcohol production will eventually be pioneering in the field of "ersatz" in its war-time meaning; with results in chemurgy, and other activities yet to be determined.

Recent moves of Federal agencies concerned with the problem in all its phases make it difficult now that no such volume of ethyl alcohol is going to be made with sugar, for several reasons. The first is, there is no such quantity of sugar as would be required, available or in sight within the strategic time limits of the war situation. A second reason is that large stores of surplus materials in which the Federal Government has tied up vast public funds are on hand, and until the present development, held every prospect of remaining so indefinitely.

There is another factor; it has been said as an axiom of the current war, that "It will not be won with dollars." In short, cost is the last consideration. Nevertheless, cost is present in most calculations, and at times has to be figured arbitrarily, unaccustomed as some Washington functionaries have been to the idea.

Recalling again that normally the bulk of 190 ethyl alcohol is produced from sugar, some highlights of the sugar situation as it is and is likely to remain indefinitely, are in order, then a look at some substitutes coming into use.

The official explanation that "Most of the difficulties in sugar are caused by war in the Pacific" is only superficial, and ignores the fact that for years Florida sugar cane growers, the same in Louisiana, and growers in American off-shore areas, particularly Puerto Rico, have been clamoring to be permitted to produce more sugar.

Puerto Rican Sugar

For several years past Puerto Ricans have been forced to leave annually a third of their cane standing uncut, amounting at times to the equivalent of 300,000 tons of sugar. Sugar is the lifeblood of the island, and all the benevolences of well-meaning American notables, all the expensive remaking of island economy, still being attempted, cannot get around the fact that when Puerto Rico grows and sells sugar, Puerto Ricans eat.

An intricate system of quotas and allocations has evolved because of a surplus of sugar in the past, and the limited world outlet for bountiful tropical produce. Hence further explanatory figures from official sources are not entirely the whole story; that the Pacific war has cut off U. S. sugar imports from the Philippines, normally about 16 per cent of the nation's supply, and Hawaii, about 14 per cent of the country's supply, with other proportions, domestic beet, 23 per cent, domestic cane six, Cuba 29, and Puerto Rico, already mentioned, furnishing 12 per cent. In other words, these are fixed proportions of the American continental market, and not what these sugar sources could supply, if allowed. For instance, Puerto Rico can grow 1,500,000 tons of sugar annually instead of the nominal 1,000,000 tons it has been allowed to grow.

Nobody could foresee the war in the early stages of these curtailments, perhaps, but since 1939 it has been very apparently present. Sugar cane is a crop that matures over a long period however, and cane not planted in time to be harvested now or in the coming months, does not help the following situation:

Demand for ethyl alcohol is up 300 per cent over normal, because of its use in manufacturing explosives and plastics. But there is not enough sugar in this country to make all that we might possibly need, and even moderately appease a public that may begin to ask questions about past policies; not only that, it is now proposed that from what supply there is, this country will endeavor to furnish quantities to other countries engaged on the same side in the war—for one, Russia, whose sugar-producing southern areas are in German hands.

For these, as well as other reasons then, the question of substitute raw materials enters. First, to expand physical producing assets, the Government has enlisted such beverage distilling plants as can produce 190 ethyl alcohol from grain, which involves about 60 per cent of that industry's present plants. Next, to conserve sugar sources, it was proposed that grain be used as a substitute for high-test molasses in alcohol production. Further, an order by the late OPM, now War Production Board, M-54, limits many less essential uses as molasses.

As a sidelight, this limitation was intended to prohibit further supplies of molasses getting into rum production; nevertheless, the Virgin Islands, on a smaller scale presenting similarly a continuing relief problem to the continental parent country (by adoption) as in Puerto Rico, will continue to make rum. They will do so by reason of a bit of Secretary of Interior Ickes' rationalizing—the order prohibits rum-making from molasses, so the islands will make it from cane juice, before it becomes molasses.

Grain Held by C.C.C.

The grain specified for use as a substitute in ethyl alcohol production was at first, Government corn, held by the Commodity Credit Corporation, and to be sold by Federal arrangements interdepartmentally, at a price geared to the price ceiling on ethyl alcohol. Since this arrangement, and at this writing, it is now intended to use a quantity, not yet announced, of Commodity Credit Corporation wheat, which will sell at a price comparable on a poundage basis, to the corn price, and which will be adjusted to the ceiling on alcohol upward or reverse.

Thus officially, we have a program to produce alcohol from two substitutes for sugar—corn and wheat. Carried further, but as yet, without any official indication that such materials will be resorted to, another crop, surplus in many years past, has been potatoes. A third substitute for sugar for this purpose thus comes to mind. A fourth, and as yet unmentioned possibility is what is un-appetizingly termed "garbage" but it holds possibilities. The list might be expanded further, but space does not allow too much speculation.

Taking any of these raw materials, however, the process would be: conversion to starch, then sugars, and, by introducing

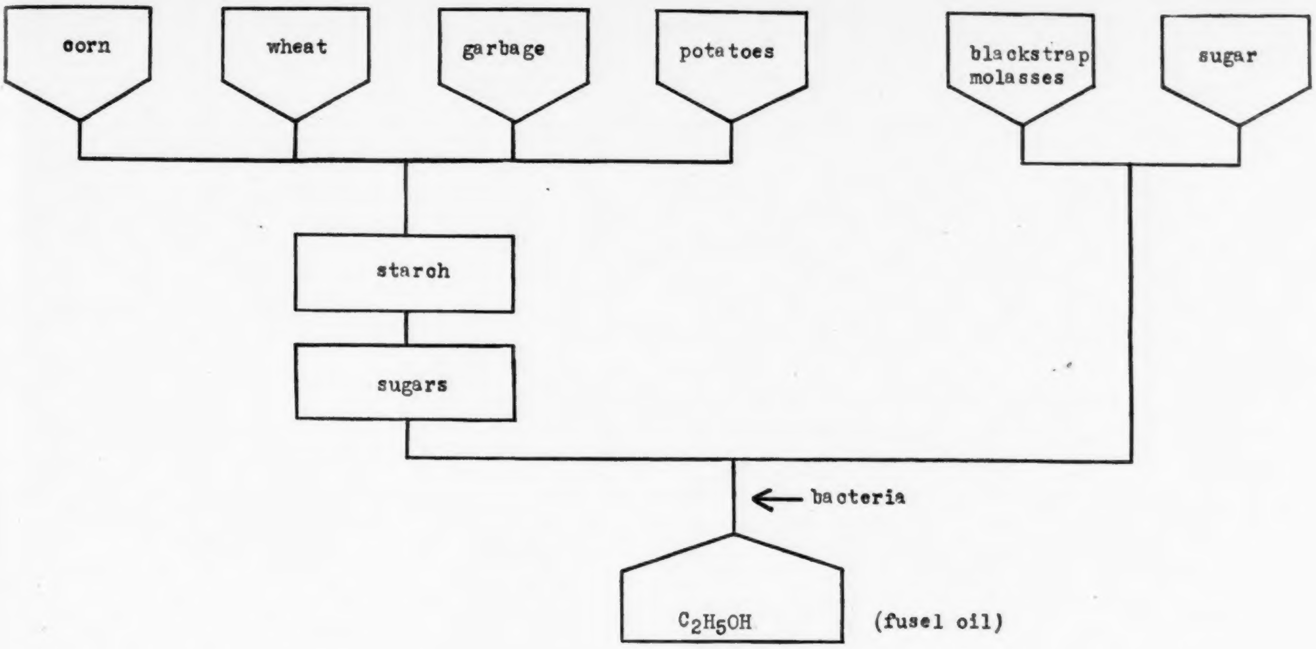


CHART 1

bacteria, the result on one side is alcohol, with a side product of some fusel oil. (See Chart 1.)

From whatever source derived, ethyl alcohol will feel an increasing emphasis as the war progresses. The normal fuel situation has apparently been restored for the time, but in other countries alcohol is a vital fuel, or component of war-fuels.

In this country it is needed now for munitions, meaning explosives and allied products, in acetic acid, involving acetates, ether, which again has uses in munitions, in solvents, so that a tabulation of fundamental uses of these will prove again the role assigned. (See Charts 2, 3, 4.)

CHART 2

Intermediate in mustard gas (Barred by treaty for war use)

ETHYL =
- **Butyl**
- **Solvents**
- **Anti-freeze solutions, motor fuels, smokeless powder**

ACETIC ACID =
- **Acetate Rayon**
- **Cellulose Acetate Plastics**

ETHER =
- **Organic Synthesis**
- **Colloiding Agent in Smokeless Powder**

CHART 3

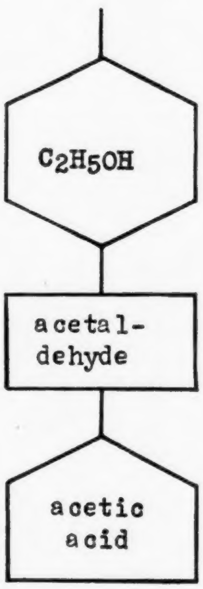
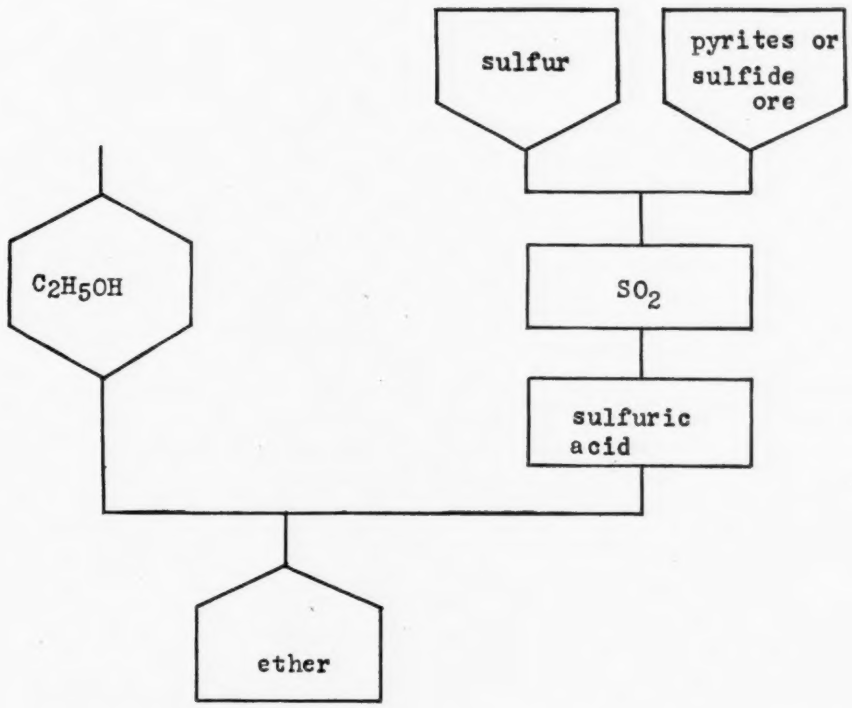


CHART 4



Booklets & Catalogs

Chemicals

A364. Blackout Preparations in the United States; Technical Bulletin No. 616. Reprint of article by Henry E. Millson, Calco Chemical Division, American Cyanamid Co.

A365. Dispersed Rubber. Handbook on water dispersed rubbers includes following sections: Story of Dispersed Rubber, Lotol (Compounded Latex), Dispersite (Water dispersion of crude or reclaimed rubber), Latex, General Handling Data, Machinery and Equipment, Books and Periodicals on Latex, Miscellaneous Engineering Data. Naugatuck Chemical Division of United States Rubber Co.

A366. Du Pont Plastics in the Headlines. In stories and pictures this booklet tells some of the outstanding developments and achievements of du Pont plastics during 1941. E. I. du Pont de Nemours & Co., Inc.

A367. Paint Selector. This booklet makes conveniently available information on properties of, and application data necessary to choose properly from line of 43 paint, enamel, and varnish products. American-Marietta Co.

A368. Protective Coatings; 45-page booklet containing detailed information about the "Tocol" line of protective coatings. Protective Coatings, Inc.

A369. Silicate P's & Q's; Vol. 22, No. 2. Loose-leaf sheet tells about the use of sodium metasilicate in de-inking of salvaged paper and in the treatment of rags used as a source of fiber in paper making.

Equipment—Containers

E602. Analyzers, Indicators, Recorders; List CEC. Describes industrial models that are claimed to operate with laboratory accuracy. Recording gas analyzers, together with pH and other equipment for making precise measurements are featured. Cambridge Instrument Co.

E603. Ball and Pebble Mills; Catalog T. 54-page booklet describes and illustrates line of mill and gives considerable technical explanation and data.

E604. Butterfly Valves; Catalog No. 10-B. Features standard and special butterfly valves for the control and shut off of fluids and semi-solids under high and sub-zero temperatures and varying pressures from 2 to 300 p. s. i. Contains performance characteristics under various conditions of service, manual and automatic control, specifications, flow charts and a discussion of and illustration of the use of bronze, steel, meehanite, molybdenum and other metals for special conditions including solenoid emergency service. R-S Products Corp.

E605. Condensate Return System; 4-page bulletin covering new Cochrane-Becker high pressure condensate return system. A typical installation is described in detail with a four-color illustration showing steam, condensate, and makeup lines. A similar drawing illustrates the operation of the jet-loop principle on which the system operates. Detailed engineering specifications cover the technical features of design and construction. Cochrane Corp.

E606. Electric Heating Units and Controls; revised 38-page catalog describes and illustrates electric heating units and controls for industrial applications involving the heating of liquids, solids or air. Handy as a reference guide, this booklet contains seven pages of application data and proper selection information in determining the most suitable types and sizes of units. Typical examples of heating problems with the correct solutions are included. Westinghouse Electric and Manufacturing Co.

E607. Engineering Pump Data; Bulletin No. 302. Contains comprehensive tables of friction losses in pipes, covering viscosities to 2400 S. S. U., valves and fittings viscosity conversion tables, tables of practical suction lifts, viscosity of various liquids at different temperatures and other data frequently required in installing pumps or making piping layouts. Blackmer Pump Co.

E608. Fire Extinguishing Apparatus. 4-page folder illustrates and explains "Dugas" fire protection. Dugas Engineering Corp.

E609. Flexible Couplings. Selector card for use in selecting flexible shaft coupling. Lovejoy Flexible Coupling Co.

E610. Glass; 30-page booklet gives extensive information on various types of glass and tells of their adaptability to modern needs. Pittsburgh Plate Glass Co.

E611. Industrial Tablet Compressing Machines; Catalog 41-T. 45-page catalog shows and describes equipment, standard and special, used for manufacture of articles by compressing. Also shows many of the products made, classified by industries. F. J. Stokes Machine Co.

E612. Lastiglas; 8-page booklet describes glass-like synthetic lining having chemical resistance and used for corrosion control in process equipment. Bishopric Products Co., Inc.

E613. Micro-porous Porcelain Filters for research, control, and production filtrations in pharmaceutical, food, metallurgical, paper and general chemical industries. Bulletin (No. 912) describes uses, sizes, porosities, filtering characteristics, and cleaning techniques; lists and illustrates remarkably complete line of precision filter-crucibles, filter-candles, filter-cylinders, filter-funnels, and special shapes; gives bubbling pressures and porosity calculations for 5 available porosities. Characteristics include: resistance to heat shock, ignition cleaning, high speed and selectivity, chemical inertness, and the ability to filter without pads or papers. The Selas Company, Ceramic Engineering Division.

Notes on Methods and Equipment for the Fluorometric Assay of Vitamins B. The Coleman Electric Co., Inc.

E614. Packaging of War Materials; Acme Process News, No. 5. Illustrated booklet tells of meeting essential strapping specifications on Government contracts. Acme Steel Co.

E615. Plant Protection Begins with Floodlighting. Folder illustrates various styles of porcelain enameled floodlights. Goodrich Electric Co.

E616. Recording Equipment for Flue Gas Analysis; Catalog N-91-163. Recent improvements in Micromax CO_2 recording equipment are described. Leeds & Northrup Co.

E617. Spray Equipment; Catalog No. 80. 32-page booklet outlines reasons for the low pressure principle under which this line of equipment operates. Describes and illustrates spray equipment for both manual and automatic operation, and air-motored agitators. Eclipse Air Brush Co., Inc.

E618. The Glass Lining; Jan.-Feb., 1942. An equipment and service magazine for the dairy, food, beverage, and chemical process industries contains articles on all-out production and Government regulations; story of famous brewery of Backus & Johnston in Lima, Peru; extraction of magnesium from the sea by Dow Chemical Co.; unusual filling problems and how they were solved; development of the Vanilla Products Co.; and a check list of cream defects with their causes and methods of prevention. The Pfaudler Co.

E619. Tramrails, Booklet No. 2008-A. 12-page illustrated booklet of engineering and application data covering the subject of overhead materials handling. The Cleveland Crane & Engineering Co.

E620. Variable Speed Transmission. Catalog-Handbook includes 52 pages of recommendations, application data, photographs, and engineering information. It gives a quick index source of reference for complete data on variable speed pulleys, variable speed transmissions and automatic tension control motor base. Includes sizes, rated capacities, design and operating details, where applicable, how installed, etc. Ideal Commutator Dresser Co.

E621. Worthite; 12-page booklet gives technical information on Worthite, an acid-resisting alloy steel for the chemical and process industries. Results of laboratory and plant tests on various chemicals and other materials are given. Worthington Pump and Machinery Corp.

Chemical Industries
522 5th Avenue
New York City

I should like to receive the following booklets:

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Name ....

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Company ....

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All information requested above *must* be given to receive attention.

Industry's Bookshelf

This Chemical Age; The Miracle of Man-Made Materials, by Williams Haynes, Alfred A. Knopf, New York, 1942-x 385, xxii pages, plates. $3.50. Reviewed by T. E. R. Singer. In recent years newspaper writers and other popularizers of scientific material have written a great deal to explain the "Miracles" of chemistry to the layman. Unfortunately, many of the writers though with the best of intentions, have led the public to expect the impossible from chemistry, or sometimes have written on subjects beyond their scientific knowledge.

Williams Haynes, former editor of "Chemical Industries" may be said to have unique qualification for explaining chemical processes and products to the public of today, which more and more is becoming interested in chemistry, but sorely needs sound guidance of a non-sensational nature. In **This Chemical Age**, Mr. Haynes devotes the first two chapters to a very simple explanation of the forming of chemical compounds with a sound historical basis. From there he proceeds with such headings as "Molecules Made to Order," "Black Tar to Bright Dye," "Sweet Smells to Savory Flavors." Again he explains how useful products are formed from materials which in themselves to the layman appear to be quite useless and most certainly unattractive. Other of Mr. Haynes's chapter headings concern the rise and fall of the German Dye Trust, Mars Chemical Dictator, the Sulfanilamide family, elastic Eldorado, the skeleton in the vegetable closet, new fibres, new fabrics, the herald of the plastic age and materials for tomorrow.

The lay public should certainly be able to find popular and easily readable information on chemical subjects, which are in everybody's minds today with the present shortage of material and rubber rationing affecting the well known "man on the street." The three chapters on rubber and rubber substitutes and on plasics as substitutes for materials should certainly be read with interest. Explosives, their history and their properties are also treated in the manner intelligible to the layman and the chapter on materials for tomorrow will explain what may, and more especially may not be expected in the future.

The book has many fine colored plates to appeal to the eye; a simple glossary of words will be found most useful and for those who have been stimulated sufficiently to read further a bibliography is suggested.

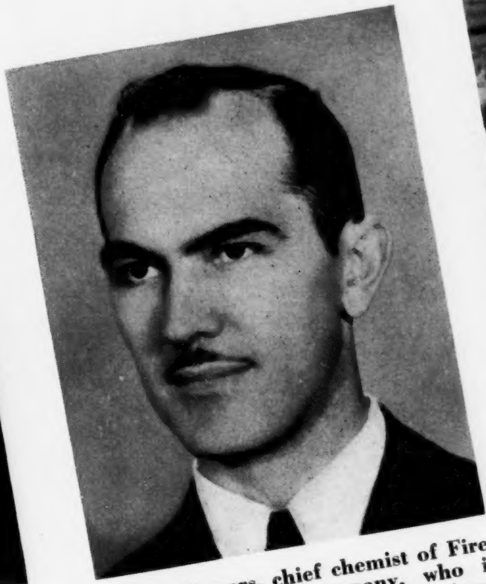
Famous Rospigliosi Cup By Cellini In 16th Century, Now In The Metropolitan Museum Of Art Of New York.

BENVENUTO CELLINI, that genius of art and color, would marvel at the exquisite colors lithographed on tin by high speed presses and the unique designs and shapes of Heekin Lithographed Cans as they stand on the shelves or counters of thousands of retailers in all sorts of businesses attracting customers and making sales. Heekin Metal Lithography is outstanding . . . yet inexpensive . . . long lasting . . . yet colorful. Heekin combines art with modern ingenuity to produce better lithographed metal packages. Let us help you make your package more attractive.

THE HEEKIN CAN CO., CINCINNATI, OHIO

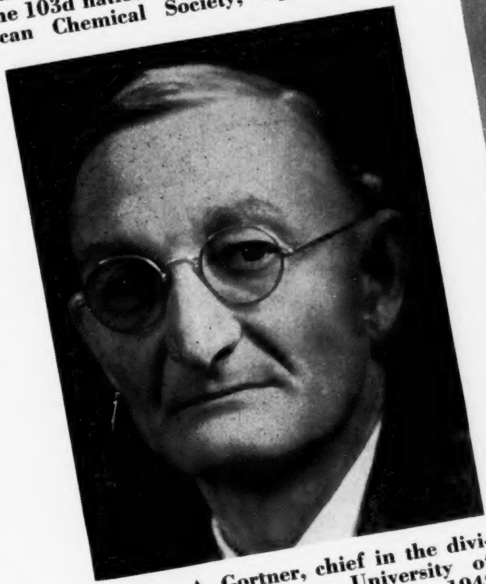
Headliners in the News

William F. Bowld, general manager of Buckeye Cotton Oil Co., Memphis, who has been named general chairman of the 103d national meeting of the American Chemical Society, April 20-24



Paul D. Bowers, chief chemist of Firestone's Tennessee company, who is vice-chairman of the 103d national meeting of the American Chemical Society which is to be held in Memphis

Victor E. Williams, Eastern Sales Manager of Monsanto, is chairman of the Reception Committee for the 17th Annual Drug, Chemical and Allied Trades Banquet to be held March 12 at the Waldorf-Astoria, N. Y. City. Net proceeds will go to the American Red Cross

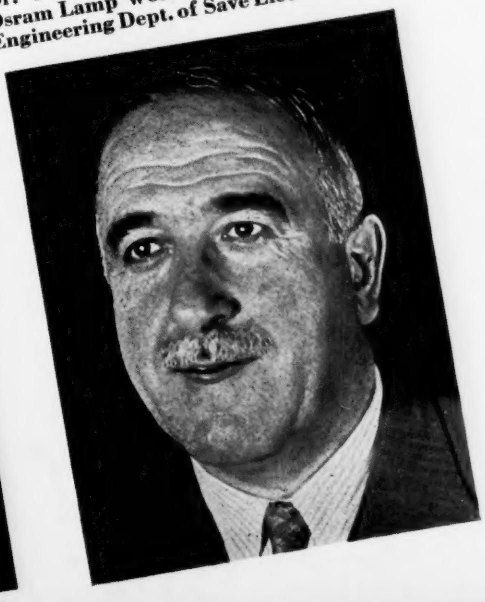


Dr. Ross A. Gortner, chief in the division of biochemistry, University of Minnesota, who will receive the 1942 Osborne Medal presented by the American Association of Cereal Chemists

James F. McNamara, mill products sales manager of International Nickel Co., who has been elected a member of the board of directors of the Lukens Steel Co., Coatesville, Pa., with Warren Snow

Thomas Midgley Jr., vice-president of Ethyl Gasoline Corp. awarded 1942 Willard Gibbs Medal Chicago Section ACS

Dr. Robert Beer, for 22 years with Osram Lamp Works, Vienna, joined the Engineering Dept. of Save Electric Corp.



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America Looks to Guayule Plant As a Source of Rubber Supplies

CUT off from sources of natural rubber now that war is raging around the Far East, America has turned to its own devices in supplying industry's huge demands. Here is one source, rubber from the guayule plant, native to the southwest. Young lad in photograph (1) is looking at a planting of two-year-old shrubs at Salinas, Calif., where guayule has been grown successfully for more than 30 years. (2) Nursery contains hundreds of thousands of guayule seedlings which were planted in April and now are ready for transplanting under five-year cycle system of growing. (3) Special harvester digs up the plants and presses them together in bales ready for milling. (4) Seed is packed in airtight drums. (5) In these stills water is forced into air holes in the cork and water logs it so that it will sink, leaving rubber to be skimmed from the top. (6) These stones are used as a primary part of the milling process. (7) After rubber is removed from milling vats it is washed to remove impurities. Then it has same chemical qualities as Hevea rubber except that its resin content is 18 to 20% against 4% for Hevea. Resins can be removed and used for plastics. In trays above rubber is cured and dried. (8) Giant crushers separate the wood pulp from the rubber. (9) From the ovens, the shrub in fine pieces is carried into crushers by conveyors. (10) In this laboratory, Harry Boucher, head chemist for Intercontinental, has devised many improvements in guayule production. Heretofore, more than 5,000 tons of guayule rubber have been sold annually to rubber companies from these plants in Salinas and Mexico.

Photos, Intercontinental Rubber Co. Courtesy, General Tire & Rubber Co.

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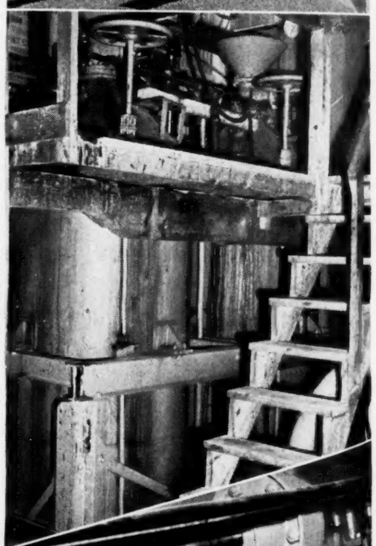

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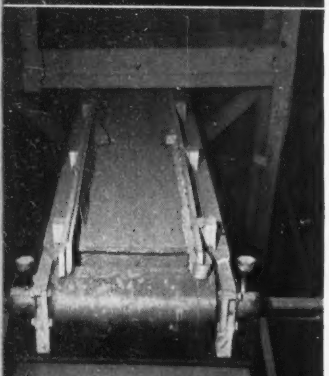

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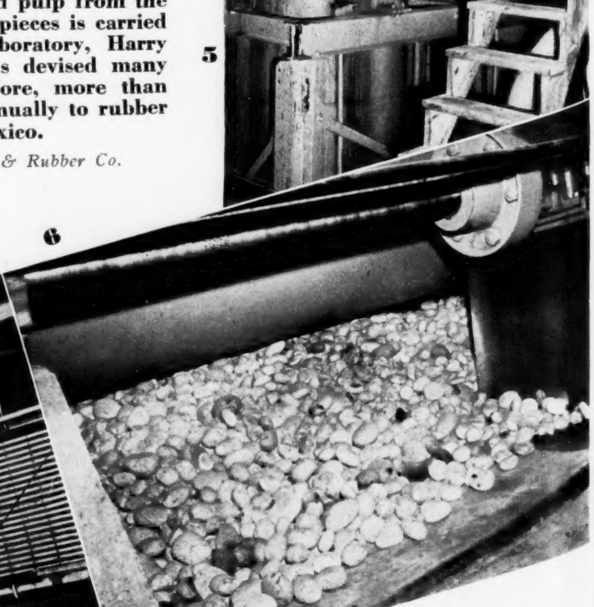

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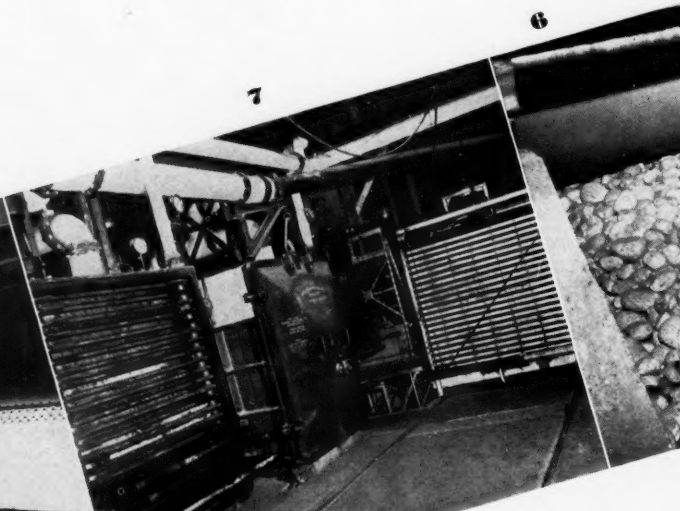

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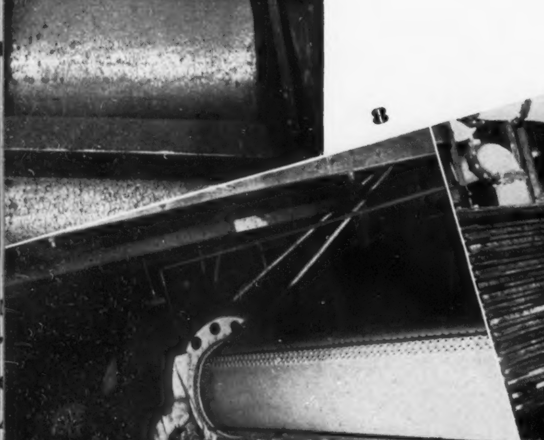

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NEW SHARPLES CHEMICALS FOR RESEARCH

PROPERTIES	N-MONOETHYL ACETAMIDE	N, N-DIETHYL ACETAMIDE	N, N-DIETHYL LAURAMIDE	N-MONO-n-BUTYL LAURAMIDE	N, N-DI-n-BUTYL LAURAMIDE
COLOR AND FORM	COLORLESS LIQUID	COLORLESS LIQUID	COLORLESS LIQUID	WHITE SOLID	PALE STRAW LIQUID
MOLECULAR WEIGHT	87.1	115.2	255.4	255.4	311.5
SPECIFIC GRAVITY @ 20°/20°C	0.923	0.932 (@25°C.)	0.865 (@25°C.)	—	0.860
LBS. PER GALLON	7.7	7.77	7.22	—	7.17
DISTILLATION RANGE °C	206-208.5	183-187	166-167	200-225 @ 2 mm.	200-230 @ 3 mm.
MELTING POINT °C	−32	<−65	40	50-54.5	−14.5
FLASH POINT °F	230	170	—	375	375
REFRACTIVE INDEX @ 20°C	1.4335	1.4326	1.4550	—	1.4567
SOLUBILITY IN WATER	SOLUBLE	SOLUBLE	INSOLUBLE	INSOLUBLE	INSOLUBLE
SOLUBILITY IN ALCOHOL	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE
SOLUBILITY IN PARAFFIN HYDROCARBONS	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE

SHARPLES TRADE MARK CHEMICALS

The alkylated acid amides described above represent a few compounds of this class that may be worthy of consideration as high boiling solvents and plasticizers. Other alkylating groups and different acids may be used in the synthesis of additional products of this type and possibly some of these would have properties better suited for certain specific applications than any described on this page.

In bringing these new products to your attention, Sharples wishes to make clear that at present all of them are available only in experimental quantities. However, it is probable that sufficiently important uses may develop which will permit commercial manufacture later.

A request on your company stationery will bring a copy of the 12th edition of Sharples Synthetic Organic Chemicals describing many other new compounds in the development stage, as well as those being manufactured commercially.

SHARPLES CHEMICALS Inc.

PHILADELPHIA CHICAGO NEW YORK

1

Monsanto Gets Navy "E" & Bureau of Ordnance Flag

Monsanto Chemical Co. last month was awarded the Navy "E" pennant and the Bureau of Ordnance flag for outstanding performance in the production of naval ordnance material vital to the war program. Monsanto company generally and the Anniston, Ala., and Monsanto, Tenn., plants specifically were mentioned in the award made by Admiral Wat T. Cluverius, U.S.N., as personal representative of Secretary of the Navy Knox. Photo (1) shows Admiral Cluverius and his party following the presentation ceremony making an inspection of the Monsanto, Tenn., operations. Left to right are Robert S. Weatherly, general sales manager, phosphate division; A. T. Beauregard, plant manager; and Admiral Cluverius. (2) The flags go up as Admiral Cluverius presents Monsanto with the Navy "E" for excellence. Presentations were made at Anniston, Ala., Monsanto, Tenn., and at St. Louis. (3) Admiral Cluverius presents Navy "E" and Bureau of Ordnance flag to Mitt Roberts and Leonard Davis of Monsanto, Tenn. plant.

2

3

American Flange & Manufacturing Company Gives its Annual Party

American Flange & Manufacturing Co., Inc., held its famous annual party Jan. 9 at the Waldorf-Astoria, N. Y. City, for about 400 guests—all representatives of the many industries the company serves. After the dinner, which you can see the guests eating (below), a varied program of entertainment (which you can't see, unfortunately) was presented.

NEWS OF THE MONTH

GOVERNMENT

Priorities Roundtable

PRIORITIES and allocations, Priorities Regulation No. 3, and the manner in which Washington authorities are attempting to solve some of the problems arising out of the material shortages, were features of a talk given by Sydney Hogerton, District Manager, Priorities Field Service (the then) OPM, at a Priorities Roundtable on Chemicals, Jan. 20. Second of a series of priority roundtables to reach industry groups in N. Y. City, it was held with the cooperation of the Commerce and Industry Association at 233 Broadway.

Herbert L. Carpenter, Chairman of the Association's Priorities Committee, presided at the meeting. Assisting Mr. Hogerton and answering questions was Stanley Oppenheim, Consulting Analyst, Priorities Field Service.

Speaking directly to 300 representatives of the chemical industry, Mr. Hogerton declared, "This has been called a war of metals. It may also be described, just as accurately, as a war of chemicals. The chemicals that go into toilet articles, proprietary medicines, and other consumer goods are needed for war production. For many of you here this war will bring grim news. The business world will have its casualties, just as heart-rending, as the casualties in the Philippines and at Wake Island.

"American industry has been urged to find substitutes for strategic materials. It would be foolish for the OPM to try to give you suggestions in this field. Your industries are the masters of substitutes. Your chemists ought to produce substitute materials which will not only keep your own industries but others alive. In short, the fate of much civilian production depends on your resourcefulness and effectiveness."

While Priorities Regulation No. 3 does not bear specifically on chemicals, Mr. Hogerton discussed the measure briefly, at the Roundtable, because of its importance to business in general. This measure designed to simplify and make more uniform individual preference ratings went into effect on February 2, 1941.

Typical of the questions asked at the roundtable was the following:

Question: We are trying to get some tin tubes, tin collapsible tubes, for medicinal purposes. This product is sold to doctors. Our manufacturer told us about a week ago that we must have priority or some recommendation from Washington.

Answer: Of course, the M-43A and M-43 orders which cover tin, restrict the production of tin tubes to 50% of your corresponding month. If that quantity is not adequate, you will have to appeal to the Tin Section on a PD-229 appeal form, which you can get from our office and fill out, stating your case.

In closing, Mr. Hogerton said that any enterprise subjected to undue hardship because of the stringency of certain materials and government regulations can take advantage of Section 944.9 of Priority Regulation No. 1. "Don't feel, after you get a negative reply to an application for a PD-1 or something else, that you have to throw up the sponge," he said. "You can always exercise the right of appeal."

Chemical Orders Discussed at the Meeting

Material	Order
Aluminum	M-1, etc.
Magnesium	M-2, etc.
Borax and Boric Acid	M-7
Copper	M-9, etc.
Polyvinyl Chloride	M-10
Zinc	M-11
Synthetic Rubber	M-13
Rubber and Rubber Products	M-15, etc.
Tricresyl, Triphenyl Phosphates	M-16
Chromium	M-18, etc.
Chlorine	M-19
Pulp	L-11
Calcium Silicon	M-20
Nickel	M-21
Iron Scrap	M-24
Formaldehyde, Paraformaldehyde, Hexamethylenetetramine and Synthetic Resins	M-25
Phenols	M-27
Chlorinated Hydrocarbon Refrigerants	M-28
Ethyl Alcohol	M-30
Methyl Alcohol	M-31
Potassium Perchlorate	M-32
Potassium Permanganate	M-33
Toluene	M-34
Phosphorus Oxychloride	M-35
Lead	M-38, etc.
Cobalt	M-39
Chlorinated Hydrocarbon Solvents	M-41
Titanium Pigments	M-44
Chlorinated Rubber	M-46
Experimental Research	P-24
Health Supplies	P-29
Research Laboratories	P-43
Laboratory Equipment and Reagent Chemicals	P-62
Industrial Explosives	P-86
Insecticides, Germicides, Fungicides	P-87
Repairs, Maintenance and Operating Supplies	P-100
Cellophane	L-20
Sodium Nitrate	M-62

LITIGATION

Schering Officials Ousted

Treasury Department last month, in a step to smash completely a long-range German scheme to control an important part of the pharmaceutical market in the Western Hemisphere, suspended Dr. Julius Weltzien, president, and seven other executives of the Schering Corp., Bloomfield, N. J. Company makes anti-shock vaccines, hormones, sulfa compounds and other medicines essential to the war effort.

Drug Association Indicted

The National Wholesale Druggists Association, 23 of its member companies and 29 officers and agents of the companies, have been charged in a Federal grand jury indictment returned Feb. 6 with conspiring to violate the Sherman Act by fixing wholesaler profit margins on drug products.

It is claimed that the indictment was the first alleging use of fair trade contracts in a manner not contemplated by the Miller-Tydings amendment to the Sherman Act nor the fair trade laws of the various states.

Indictment alleged that the defendants conspired to maintain profit margins by fixing purchasing and resale prices. The association, it was charged, circulated literature among the members purporting to analyze their handling and operating costs and listing purchasing and selling prices that they should demand.

Bausch & Lomb Absolved

Federal Judge Alfred C. Coxe last month dismissed the $40,000,000 suit brought by Murray Brensilber and Samuel Thibner, New York lawyers, against Bausch & Lomb Optical Company; Carl Zeiss, Inc., and three Bausch & Lomb executives.

The case was brought under an old Civil War statute and Judge Coxe, after hearing argument, said he was convinced that the statute, which authorized citizens in cases of fraud against the government to bring suit for double damages on behalf of the United States and themselves, "does not apply to this case, nor to anti-trust proceedings."

Carbon Suit Remanded

The patent infringement suit brought by Binney & Smith Co. against United Carbon Co. after having been dismissed by the District Court at Charleston, W. Va., has been remanded to the lower court following a judgment reversal by the Fourth

United States Circuit Court of Appeals at Charlotte, N. C.

Binney & Smith charged that United Carbon had unlawfully used its patented process for the manufacture of dust-free carbon black pellets used in the making of automobile tires. First trial brought dismissal when it was held that Binney & Smith had no cause for action since there were recognizable differences in the products of the two companies. Court of Appeals, however, said that Binney & Smith was the first company to solve the problem of dust nuisance in the use of carbon black for tire manufacture.

ASSOCIATIONS

Defer Engineers He Says

Engineers and technicians should be deferred because of their importance in war production and young men with scientific training should not feel reluctant about applying for occupational deferment, Albert E. Marshall, president of the Rumford Chemical Works, told members of the Junior Engineering Society of Rhode Island, at a meeting this month in Providence.

Rubber Group Meets

Chicago Rubber Group met Feb. 5 at the Congress Hotel, Chicago. Dr. A. H. Somerville, R. T. Vanderbilt & Co., N. Y. City, was guest speaker. He presented a paper on "Weather Aging."

Next meeting of the group will be held May 2 at the Congress Hotel at which the Rubber Chemicals Division of Monsanto will provide an interesting presentation.

Penn AIC to Meet

Pennsylvania Chapter of the American Institute of Chemists will meet Feb. 24 at Houston Hall, University of Pennsylvania, 3417 Spruce St., Philadelphia, at 8:00 P. M. Dr. Maximilian Ehrenstein will speak on "Hormones of the Sex Glands and Adrenal Cortex." Dinner will be served at 6:30.

17th ADCAT Banquet March 12

Seventeenth Annual Drug, Chemical and Allied Trades Banquet will be held March 12 at the Hotel Waldorf-Astoria, N. Y. City, this section of the N. Y. Board of Trade has announced. American Red Cross is to receive all profits of the affair this year.

AMH Conference March 4

A conference to discuss the wartime problems of selling organization in the industrial and consumer fields will be held March 4 and 5, it has been announced by the American Management Association at the Hotel Roosevelt, N. Y. City.

GENERAL

Viscosity Symposium

A symposium on "Viscosity, Molecular Size and Molecular Shape" will be held under the sponsorship of the Society of Rheology at the Brooklyn Polytechnic Institute, Feb. 20, 1942.

Dyestuffs Committee

Formation of a Dyestuff Manufacturers Industry Advisory Committee was announced this month by the Bureau of Industry Advisory Committees of the War Production Board.

Dr. Arnold L. Lippert of the Textiles, Clothing and Leather Goods Branch of the WPB has been designated Government Presiding Officer.

New Solvay Sales Agent

Solvay Sales Corp. has appointed National Aniline & Chemical Co., U. S. A., Inc., as its sales agent for export sales of alkalis and other chemicals manufactured by the Solvay Process Co., Syracuse, N. Y. Up to the first of this year, Alkali Export Sales Association was the company's agent.

Hooker Library Dedicated

Dedication of the Hooker Scientific Library to American scientists was announced by the Friends of the Hooker Scientific Library in the January issue of their official organ, "Record of Chemical Progress." The dedication is in fulfilment of Dr. Hooker's desire, but was not publicly announced until the library was able to establish a comprehensive plan of technical literature services.

Russell Promoted

John C. Russell has been appointed assistant sales manager of the Philadelphia Quartz Co., Philadelphia, after having served with the sales department of the company since 1924.

COMPANIES

Ferro Enamel Renamed

W. B. Lawson, Inc., Cleveland, announces that Chase Drier & Chemical Co., Bedford, Ohio, wholly-owned subsidiary of Ferro Enamel Corp., has been renamed Ferro Drier & Chemical Co.

W. B. Lawson, Inc., as sole sales agent of Ferro Drier & Chemical Co., has the following territorial sales agents: Touraine Chemical Co., N. Y. City; H. R. Hamberg, St. Louis; Oscar J. Friend, Minneapolis; E. R. Dornoff, Chicago.

Victor Workers Buy Bonds

Employees (99.48% of them) at all the plants and offices of the Victor Chemical Works have voluntarily subscribed to the Defense Bond Purchase Plan. This active participation in the Defense Program was made possible through the Payroll Savings Plan for the Purchase of United States Savings Bonds, sponsored by the company.

Army Gets Chemical Plant

The Chemical Warfare Service's St. Louis Plant No. 1, located at Monsanto, Ill., has been turned over to the army by Monsanto Chemical Co.

The chemicals to be produced in the plant, according to the Chemical Warfare Service's original announcement, are to be used by the service in the manufacture of gas protective equipment for troops.

ISCO'S 50th Year

Innis, Speiden & Co. this year celebrates the Silver Jubilee of the ISCO Chemical Co. which was started in 1917 as one of the first steps to meet a changed chemical market, beginning with operation of an electrolytic plant at Niagara Falls.

Warner in New Offices

To increase its facilities for serving chemical consumers in the middle west, the Warner Chemical Co. has expanded its Chicago office and now occupies new quarters at 141 West Jackson Blvd. W. Newell Wyatt is divisional sales manager in charge of the territory, not only for the Warner Chemical Co., but also for the California Chemical Co. and the Magnesol Co., all divisions of the Westvaco Chlorine Products Corp.

Baker Fellowship

J. T. Baker Chemical Co. Research Fellowships in Analytical Chemistry for the academic year 1942-1943 have recently been described on brochures widely dis-

tributed to colleges and universities. Two of these Fellowships are to be granted and each carries an award of $1,000. One is awarded to a graduate student in Analytical Chemistry attending an Eastern university and the other to a graduate student at a Midwestern university. Applications should be made before Feb. 15, 1942, to Professor John H. Yoe, University of Virginia, University, Va., for the Eastern Fellowship, and to Professor H. H. Willard, University of Michigan, Ann Arbor, Mich., for the Midwestern Fellowship.

In New Offices

Bakelite Corp., unit of Union Carbide & Carbon Corp., has established a new sales office for Bakelite varnish resins at Cincinnati, O. New office, which will be under the direction of Robert B. Waters, is located at 2506 May st.

Naugatuck Aromatics, supplier of aromatic products of Naugatuck Chemical Division, U. S. Rubber Co., has established new quarters at 254 Fourth ave., N. Y. City.

New offices with enlarged facilities were opened Jan. 8 for William D. Neuberg Co., 420 Lexington ave., N. Y. City. New telephone number is Lexington 2-3324.

Printing Materials Division of Bakelite Corp., now is located at 300 Madison ave., N. Y. City.

CONSTRUCTION

Mathieson Alkali Works this month completed negotiations with the Defense Plants Corporation for the construction of a new magnesium plant at Lake Charles, La., at a cost of about $22,500,000. New plant, on which work has begun, will have a capacity of 36,000,000 pounds of magnesium a year.

Dolomite, obtainable at nearby quarries, will be used. This material is calcined, locally produced natural gas being used for this purpose. The resulting oxides of calcium and magnesium are treated with calcium chloride, a product of the process by which soda ash is made at the local Mathieson plant. The mass is then treated with carbon dioxide, obtained from the calcination of the dolomite, which converts the calcium into the insoluble carbonate, leaving magnesium chloride. This product, after being concentrated, is electrolyzed, forming magnesium and chlorine, both of which are essential war chemicals.

Corning Glass Works is expected to begin production by July 1 of this year in a new glass manufacturing plant at Parkersburg, W. Va., now under construction by the Defense Plants Corporation. Cost is said to be between two and three million dollars. Details, because of War Department regulations, are not available.

A new factory for the exclusive manufacture of improved types of asbestos yarns and fabrics will be constructed by the U. S. Rubber Co. in Hogansville, Ga. Company also has purchased the Hogansville plant of the Calloway Mills together with its equipment which will enable the company to make substantially all of its own duck for belting, hose, and other mechanical goods.

Construction of a $55,000,000 TNT plant at Huntington, W. Va., begins Feb. 15. It will be known as the West Virginia Ordnance Works.

Construction of the $2,750,000 synthetic rubber plant of the Naugatuck Chemical Division of U. S. Rubber is being speeded up so that the plant will open sooner than expected, it has been revealed. Operations were expected to begin by midsummer according to original plans.

New England Lime Co., Adams, Mass., is completing negotiations with the Defense Plant Corporation for the erection of a plant to produce metallic magnesium from dolomite by a new process. New plant will cost about $2,500,000 and will have an annual capacity of 7,500,000 pounds. Process is one of direct conversion using ferrosilicon as the agent.

Providing the main source of water supply for the 63 million dollar Basic Magnesium reduction plant near Boulder City, Nevada, Peerless Pump Division of the Food Machinery Corp. reports a novel design of six high capacity deep-well turbine pumps for this new project.

PERSONNEL

E. M. Kolb, associated with American Potash & Chemical Corp. since 1932, has been appointed manager of potash sales. In 1934, he opened a branch sales office in Baltimore and remained in charge there until 1939, when the branch was closed. Since that time, he has been assigned to the General Sales Office in New York.

Mr. Kolb was graduated from the University of Missouri and, previous to coming to the American Potash & Chemical Corporation, in 1932, he was associated with the Eagle Picher Lead Company.

R. M. Curts, associated with American Potash & Chemical Corp. since 1931, has been appointed manager of borax sales, effective Feb. 1. During the first few years of his employment, much of his time was devoted to the technical problems of the sales department, primarily relating to the increasing use of borax and boric acid in the ceramic industry and to the development and sales of new chemicals subsequently manufactured by the Corporation. He was graduated from Cornell University in 1923 and from Princeton in 1924, following which he was employed by the New Jersey Zinc Co., serving in the research department and, later, in the technical service division until he resigned to join American Potash. In addition to assuming the responsibilities of manager of borax sales, he will continue to handle the sales of bromine, bromides and lithium salts.

J. Oostermeyer has been elected president of Shell Chemical Co., San Francisco, succeeding **C. B. de Bruijn** who has retired after 33 years of service. Oostermeyer has been with Shell for 25 years and has been vice-president of the company since 1939.

J. OOSTERMEYER

R. M. CURTS

E. I. du Pont de Nemours & Co. announced recently the election to the board of directors of **Lammot du Pont Copeland** and **Crawford Greenewalt** to succeed Charles Copeland and F. B. Davis, Jr., who resigned.

Coleman R. Caryl, assistant to the administrative director of Stamford Research Laboratories and for almost 18 years with American Cyanamid in sales, technical service and research, spoke last month before the Worcester Polytechnic Institute student chapter of the American Institute of Chemical Engineers. His subject was "The Operation of an Industrial Research Laboratory."

Dr. Willard H. Dow, president of Dow Chemical, has been elected a member of the corporation of the Massachusetts Institute of Technology for a special term of five years.

Gustavus J. Esselen, Ph.D., has been appointed by Governor Saltonstall to be a member of the Massachusetts State Board of Registration of Professional Engineers.

Wilson T. Lundy, vice-president of Freeport Sulphur Co., has been elected a director and **D. T. McIver,** assistant general manager, has been named general manager in charge of the company's sulfur operations.

Edmund D. Wingfield has been appointed administrative superintendent of the Freeport Sulphur Co.

The John Fritz Medal, highest award in the engineering profession, was presented Jan. 14 to **Everett Lee DeGolyer,** consulting petroleum engineer of Dallas, Tex., at a dinner in the Waldorf-Astoria, N. Y. City, under the auspices of the American Institute of Mining and Metallurgical Engineers. Award was made in recognition of his pioneer work in the application of geophysical exploration to the search of oil fields.

Dr. Frank E. Dolian of Commercial Solvents Corporation, Terre Haute, Indiana, reported on January 14th for active duty as a lieutenant with the U. S. Army. **Frank E. Maple** has taken over the work formerly handled by Dr. Dolian which consists of technical service and market development activities.

OBITUARIES

William P. Fitzgerald

William Preston Fitzgerald, vice-president of the J. T. Baker Chemical Co., died Jan. 20 at his home in Easton, Pa. He was 63 years old.

Otto S. King

Otto S. King, vice-president and director of the Ohio Chemical and Manufacturing Co., died Jan. 31 in the Lenox Hill Hospital, N. Y. City, after a four-day illness, of pneumonia and heart disease. He was 65.

Clifford D. Holley

Dr. Clifford Dyer Holley, Head of Sherwin-Williams Research Laboratories, died Jan. 16 after having been in poor health since February of last year when he suffered a severe attack of flu. He was 64 years old.

He was a member of the American Society for Testing Materials, American Chemical Society, Federation of Paint and Varnish Production Clubs, Alpha Chi Sigma, South Shore Country Club of Chicago, Detroit Athletic Club, Detroit, Michigan.

DR. C. D. HOLLEY

Washington

(*Continued from page 146*)

Assurances have been given by the Chemicals and Allied Products Branch of WPB that despite the general chlorine shortage, necessary amounts for water purification and sewage treatment will be supplied. Some change is use of chlorine products may be necessary in individual plants, but no impairment of sterilization efficiency was anticipated.

The WPB has relaxed the Fats and Oils Order to permit processors to use supplies in filling contracts for finished products until further notice, thus substituting a processing restriction in place of the former three-months' inventory restriction.

More Personnel

L. R. Moffatt, chemist for Canada Dry Ginger Ale, Inc., won the recent prize contest sponsored by Graver Tank & Mfg. Co., Inc., at the 18th Exposition of Chemical Industries at Grand Central Palace, N. Y. City. Prize of $50 was offered for closest estimate of weights of water conditioning chemicals in a glass container on display at the booth.

W. A. Wirene has been appointed assistant sales manager of the Petroleum, Chemical, Mining, and Steel Mill section of the General Electric Industrial Department.

Charles L. Jones, president of the Jones-Atkinson Corp., has been elected a director of Continental Can Co., Inc.

Dr. C. F. Rassweiler, who joined Johns-Manville last June as director of research, has been appointed a vice-president.

Recent additions to the staff of Foster D. Snell, Inc., include: **Pat Macaluso, Edgar W. Goth, Peter A. Pfeiffer, Herbert H. Watjen.**

John R. Hoover has been appointed manager of synthetic sales of the B. F. Goodrich Company succeeding **Dr. H. E. Fritz,** who was recently named company director of research. He is succeeded by **Herman C. Klein,** who had been sales engineer in the department.

V. H. Fischer, Dodge & Olcott Co., was elected president of the Essential Oil Association of U. S. A. at its annual meeting, Jan. 9. . . . **John H. Montgomery,** secretary of Fritzsche Brothers, Inc., was elected vice-president, and **Robert B. Magnus** of Magnus, Mabee & Reynard, Inc., was sustained as secretary-treasurer.

Foreign Literature DIGEST

By

T. E. R. Singer.

BOLETIM DO CONSELHO FEDERAL DE COMERCIO EXTERIOR, Vol. IV, No. 37 (Rio de Janeiro, Sept. 22, 1941). p. 5-8.

Manganese, the strategic metal of primary importance, is used principally in the steel industry, which consumes about 95% of the world's production of the mineral.

Russia is the first producer, controlling about 60% of the world's total. The other great producers are as follows, in the order of their importance: India, South Africa, the Gold Coast, Brazil and Cuba. The exportation from each of these countries is discussed in detail, accompanied with statistical data.

The world's greatest importers are the United States, Great Britain, Germany and certain countries occupied by the latter, such as France, Belgium and Holland. Neither Germany nor the occupied countries are important markets for the Brazilian mineral.

The Brazilian exportation of manganese is given in tons for the period of 1913 to 1919 to Germany, Belgium, United States, France, Great Britain, Holland, Italy, Argentine and others. Another table gives the Brazilian exportation of manganese in the period from 1939 to the first half of 1941, some of which are as follows:

Country	1939 (*Tons*)	1940 (*Tons*)	1st Half of 1941 (*Tons*)
Germany	37,306	....	....
United States	134,963	215,601	143,382
Holland	4,572	....	....
Tchechoslavakia	5,964	....	....

The United States as an importer is discussed in detail.

Brazil occupies third place among the world's producers and exporters, following Russia and the British Empire. The Brazilian production reached a total of 306,025 tons in 1938, 257,752 tons in 1939, and 313,391 tons in 1940. The chief Brazilian reserves are listed and discussed.

The Brazilian exportation of the manganese mineral reached a total of 205,725 tons in 1938, 189,003 tons in 1939 and 222,713 tons in 1940. In the first six months of 1941 the exportation was 157,102 tons, or 70.5% of the volume and 84.2% of the value of the total exportations during the entire year of 1940. It is expected that the 1941 exportation figure will attain a minimum of 300,000 tons.

The United States is the chief consumer of the Brazilian mineral. Cuba is Brazil's most serious competitor in America.

This report contains considerable other statistical data on the subject.

BOLETIN DE OBRAS SANITARIAS DE NACION, p. 167-178. Vol. V, No. 50, August, 1941.

Water and Sewage Purification: A chemical and microbiological manual on water and sewage purification was prepared by the Laboratory of the O. S. N. (of Argentina). It recommended that chemical and bacteriologic analyses be carried out twice a month on the water consumed by the public, three times a year on water in various stages of purification or from different wells, and three times a year on water taken from pipes in the distribution system. The proposed plan can be carried out efficiently since the laboratory sends out the flasks for samples regularly and at specific times. In case of some abnormality the district chief is to send a special sample. Directions and suggestions are given in the manual for obtaining the different kinds of samples and disposing of them.

If some abnormality is discovered in the sample of water, the laboratory immediately communicates with the district chief who takes the proper measures as suggested in the manual. There are also instructions on the purification of water with charts showing the different types of compounds and elements that may be found in the water, as well as the various bacteria, algae, etc. There is a section on the clarification of water, giving the various coagulation methods generally employed, a section on alkalization and anticorrosion treatments, on disinfection with chlorine and its compounds. The manual is continued in another issue of this publication and deals with the treatment of sewages.

Markets in Review

Heavy Chemicals — Fine Chemicals — Coal Tar Chemicals — Raw Materials — Agricultural Chemicals — Pigments and Solvents

By Paul B. Slawter, Jr., Market Editor

WAR production walked in last month as production management went out. In an Executive Order Jan. 16, President Roosevelt created a War Production Board and later dissolved the Office of Production Management just as most people were getting to know what OPM stood for. Abolition of the OPM, however, did not in any way affect the priorities system which is still in full effect. A great many businessmen felt that the end of the OPM meant the end of limitation and priority orders and the end of filing reports as required by previous regulations. Advice from Washington quickly put an end to their reveries and they all went back to filing their reports.

Appointment of Donald Nelson as chairman of the board was welcomed by the chemical industry and all hands expect that he will do a magnificent job. There seem to be reports, however, that if he doesn't come through with the goods, Milo Perkins stands ready to take over. Come what may, it looks like a tough pull for everyone.

So far WPB seems to have been spending its time completing studies and making the necessary adjustments. In the first three weeks of its existence it revised upward the aluminum and magnesium expansion figures which may be changed again as the detailed war program unfolds. At the same time, new plans are under way for stepping up lead and copper production.

On the government list of things done since last month were the following accomplishments: ¶ Ceiling price on lead was raised because of special conditions prevailing in that industry. (Lead imports from Australia, Burma and Canada are likely to be curtailed.) ¶ Manufacturers of metallic lead products and lead pigments were asked not to make any sales at prices above those in effect as of Jan. 2. ¶ An amendment to Price Schedule No. 21 for formaldehyde was put into effect, withdrawing exemptions for the product to be used in embalming fluids from maximum prices and putting all users on the same basis regardless of purpose for which it is to be put. ¶ Seven additional materials were brought under terms of General Imports Order M-63—hides and skins, asbestos from South Africa, rapeseed oil, coconut oil, copra, palm oil and tung oil. This makes 21 materials covered at this time. ¶ Further tightening of control over chromium was announced. ¶ A complete allocations system for sodium nitrate went into effect Feb. 1. Cadmium deliveries have been restricted and many uses banned. ¶ Nickel also is prohibited for a long list of items. ¶ Temporary maximum prices were established for sales of fish meal. ¶ Conservation order M-78 conserves the supply of mercury for the nation's war purposes. ¶ The war chemical industry is to receive assistance of high priority ratings in securing necessary repair, maintenance and operating supplies. ¶ Necessary amounts of chlorine for water purification will be provided throughout the country, the chemicals and allied products branch of WPB announced Jan. 27. ¶ Diphenylamine was placed under complete allocation control Feb. 1. ¶ Maximum price of oxalic acid has been set at 11¼ cents a pound for 100 pound lots. Ceiling price is that which the majority of producers have charged since Oct. 1, 1941. ¶ Advances in price of $1 a ton on borax and $2 a ton on boric acid were permitted by OPA Jan. 28. ¶ Carbon tetrachloride price ceiling was imposed Feb. 2 at current levels. ¶ Paraffin wax base points have been eliminated to speed long hauls for war production. ¶ Order on fats and oils has been relaxed by eliminating the 3-months' inventory restriction and substituting a restriction on processing. ¶ A maximum price of $0.0425 a pound for the normal grade of lithopone went into effect Feb. 2. ¶ Agar was put under full priority control Feb. 9. ¶ Mercury prices have been set at the level which prevailed between Oct. 1 and Oct. 15 ($191 to $193). ¶ A price ceiling has been put on acetyl salicylic acid, effective Feb. 16. ¶ A schedule of maximum prices on citric acid effective Feb. 16 has been issued with prices at levels existing since 1939.

Heavy Chemicals: Production of most plants is at full capacity but materials cannot be bought in the spot market for immediate delivery. Export situation seems to indicate that the government will continue to encourage shipments to Great Britain, Canada and South America. This won't help shortages in this country any. Calcium chloride can still be bought in the open market and production continues at high levels. No shortage of this chemical is expected. All outside lots of oxalic acid, lithopone and carbon tetrachloride have disappeared from the export market. Dealers don't like the price ceilings put on oxalic acid, lithopone and carbon tetrachloride. Profits have been cut to pin money size. There are lots of export inquiries for alkalies. A leading producer of copper sulfate is doubling production at one plant. Division of Export Control at Washington and exporters are fighting over withheld licenses. Office says prices quoted on materials for export to Latin America and India are too high. Exporters say they are not when you consider costs involved.

Tremendous quantities of chemicals are going into manufacture of batteries and into such industries as paper, dye, textile and others. Bichromate manufacturers report that they are now fulfilling the orders of regular customers with reasonable promptness but cannot tell what will happen in the future because of the position of the ore. There have been rumors that alkalies may be placed under allocation and an emergency pool formed to provide for war production and exports to Latin America.

Fine Chemicals: Price schedule on citric acid, effective Feb. 16, was prompted by resale prices more than three times those quoted by producers. It was found after investigation by OPA that no justifiable reasons exist for producers and primary jobbers charging more than 20 cents a pound or for reseller or exporters charging more than 26 cents and 28 cents for sales of USP granular in carload lots. Chemical section of WPB has released information that there is some alcohol available and that purchasers should not give up trying if one firm refuses to accept an order. Alcohol manufacturers have discontinued making lower grades of witch-hazel extract.

Buyers found out last month that most of the chemical solvents are going into the manufacture of war materials. No sellers of hexamethylenetetramine were found in the open market by one prospective customer. Glycerine manufacturers are restricting deliveries to their regular customers. Any bromides offered in the open market are snapped up as quickly as possible. Production of menthol from domestic peppermint oil is in view since we have been cut off from Chinese and Japanese products. Lower prices, because of increased production, have been announced by manufacturers of nicotomide, ascorbic acid and riboflavin. Quinine, acetylsalicylic acid, bromides, iodides and sulfanilamide are getting strong seasonal calls. No glycerophosphates are offered in the open market and there isn't much for export.

Regulations governing receipts and shipments of ethyl alcohol and related compounds, brought under control by General Preference Order M-30 in August 1941, are revised under the terms of Amendment No. 3 to the original order, it was announced January 24.

Principal points of the amendment, effective immediately, are:

1. Definition of ethyl alcohol is changed to indicate that alcohol for industrial purposes only is comprehended. Proprietary solvent is included in the definition of this term.

2. Restrictions on receipts will henceforth be by calendar quarterly periods, rather than by monthly periods. Restrictions on producers' deliveries, previously contained in the order, are rescinded.

3. Certain orders, including those with an A-1-j or higher rating, may be filled without reference to quantity limitations. Quantities delivered under these orders shall be in addition to the restricted quantities permissible.

4. Deliveries to the Army and Navy, Lend-Lease countries, and persons holding Internal Revenue permits for the acquisition of tax-free alcohol are exempted from quantity and certificate requirements. Also exempted from the provisions of the order are monthly deliveries of 54 gallons or less of ethyl or isopropyl alcohol to any one person during one month.

Coal Tar Chemicals: With toluol under complete allocation bulk of output is going into the manufacture of TNT for munitions. Benzol producers are going to be called on to fill increasing needs far beyond their expectations with the stimulated production of synthetic rubber and munitions. With the scarcity of toluol, some users have switched to xylol but this, too, is now becoming scarcer. Little or no phenol is offered in the open market. Intermediates are going out to dye manufacturers in great quantities. Export demand in this industry is heavy but shortages of many basic items are causing new problems each day. H acid, aniline oil, betanaphthol are hard to get. Imported cresylic acid looks farther and farther away with war all around the waters of the U. S. and domestic production goes directly into consumption. Naturally, war plants get preference. Anthraquinone and phthalic anhydride are also on the scarce list. Allocations of tar acids have worked well but were delayed slightly this month because of the changeover from OPM to WPB. Production of by-product and beehive coke during December established an all-time monthly record and brought the total output for the year far above any previous production. (Diphenylamine is under complete allocation, as noted before.)

Raw Materials: With former trade channels for natural tanning materials disrupted by current hostilities, the U. S. must seek other sources of supply in these products vital to its leather industry. Reduced arrivals from Asia and South Africa will turn the industry almost entirely to products of the Western Hemisphere.

No longer can United States processors obtain dependable supplies of mangrove (cutch) extract from Malaya and Borneo, myrobalans from India, wattle from South Africa, and nutgalls from China. Imports of quebracho from Argentina and Paraguay, divi-divi from Colombia and Venezuela, and some of the lesser known Western Hemisphere products—such as tara, algarobilla, cascalote, and canaigre—will thus be increased. It may even be necessary to turn again to domestic sources and investigate the possibilities of native materials which have long been neglected.

The U. S. has a number of native products which may serve as a source of tannin for industrial use. Among these are chestnut, oak, hemlock, spruce, and mangrove.

The most important of these domestic products, from the standpoint of volume, is chestnut extract, consumption of which equals that of all the other domestic tannins combined.

Domestic production of chestnut extract during 1941 is estimated at a little more than 300,000,000 pounds, an increase of 25% over the output in 1940. Shipments abroad in 1941 amounted to about 5% of domestic production in that year. Stocks of finished extracts at the close of the year approximated 7,500,000 pounds, which was much lower than at the corresponding period for many years.

Actual sales by producers of chestnut extract during 1941 are estimated at almost 305,000,000, a gain of more than 30% over 1940 sales. Both production and sales are expected to be higher in 1942 than in 1941.

Among the native tanning materials which have been neglected for years is mangrove bark from the thickets of Florida and the Gulf region. The large stands of mangrove throughout the southern coastal area could provide large quantities of tanning extract.

Domestic mangrove extract was formerly a commodity of some importance in Florida; but because of the difficulty in obtaining labor at rates that could produce it in competition with cheaper foreign products, the industry gradually died out. It is believed that a survey should be made of available supplies of mangrove and of production costs of the extract under present conditions. A revival of this industry might now be feasible if it can be operated on an economic basis.

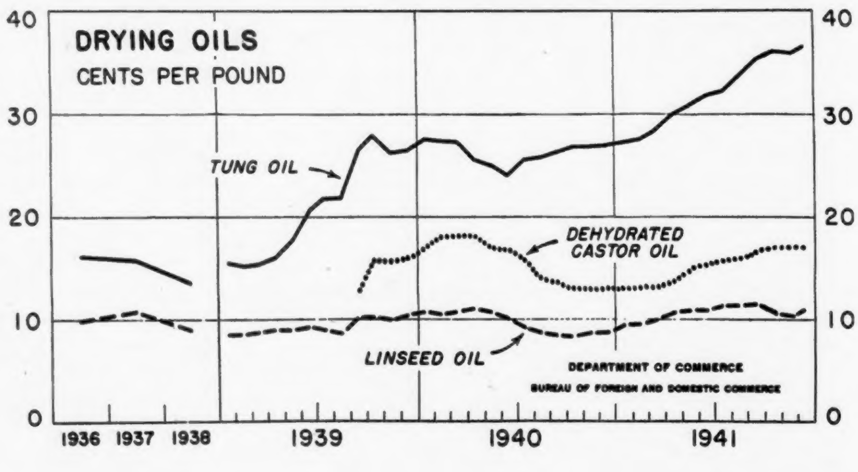
The recent activity of OPA in establishing price ceilings on the products of many branches of the tanning industry has had the effect of curtailing any tendency to increase quotations.

Gum spirits turpentine and rosins face tremendous Spring demands. Naval stores position is expected to be protected amply by several provisions in price control. The government has assured the industry, which was concerned about it, that opinions of well-informed producers will be sought when any matters concerning gum naval stores are under consideration. American naval stores producers are being called upon to increase their 1942 output more than 50% over 1941. Floor prices for gum turpentine and gum rosin for 1942 now rest on basis satisfactory to naval stores producers. Spirits turpentine can go to about 86 cents a gallon and rosins can go up substantially before price control can be injected.

Fertilizer Materials: Estimation of fertilizer supplies for the first wartime crop American farmers have put out in 22 years has been made by Charles J. Brand, Executive Secretary and Treasurer of the National Fertilizer Association.

"On the threshold of this fertilizer ship-

WHOLESALE PRICES OF VARIOUS FATS AND OILS



 Prepared Monthly by U. S. Industrial Chemicals, Inc.

U.S.I. CHEMICAL NEWS

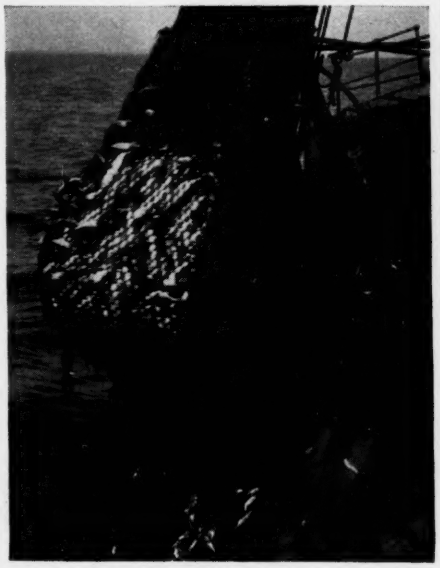
February ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1942

Chemical Treatment Found to Lengthen Life of Fish Nets

Chlorinated Rubber and Butyl Phthalate Used in Preservative

VANCOUVER, B. C.—The life of fish nets can be extended by a new chemical treatment utilizing a solution of chlorinated pale crepe rubber plasticized by butyl phthalate (dibutyl phthalate) and containing a bactericide, according to reports here.

Strands treated in this manner retain the necessary flexibility, and show substantially increased life in sea water. Moreover, the treated strands are described as easier to handle and to clean. There is also apparently less tendency for knots to slip.



Longer life for fish nets such as this is expected to result from a new chemical treatment.

Ethanol Reported Useful In Mothproofing Process

SANFORD, Maine—Successful mothproofing of wool and other fabrics at the same time as they are dry-cleaned may be simplified by a new technique which employs solutions of salicylic and boric acid in ethanol.

Salicylic acid, according to an inventor here who has patented the process, is retained by wool and other fabrics subject to attack by moth larvae, and renders the fabrics immune to such attacks. Salicylic acid, however, is not soluble in ordinary dry-cleaning solvents, and hence has not been adaptable to simultaneous mothproofing and dry-cleaning.

This difficulty is apparently overcome by first dissolving the salicylic acid, together with boric acid, in ethanol, and then mixing this solution with the dry-cleaning solvent. Volume of ethanol used should be about one-fifth that of the dry-cleaning fluids. The boric acid provides additional resistance to mildew.

Presence of Water Seen as Key to Action of Resin Solutions

Explanation of Anomalies is Provided by Viewing Solutions As Three-Component Systems, With Water as Third Component

A simple explanation of several anomalies which have been observed in connection with the dissolving of certain resins in organic solvents is offered by a theory which was recently propounded in the *Journal of the Indian Chemical Society*. According to this theory, the apparent anomalies result from the fact that these solutions, which are customarily regarded as two-component systems, are in reality three-component systems.

The third component in these systems is usually water, which is contained in the resins, but the presence of which is easily overlooked when anhydrous solvents are employed. It is, of course, a well-known fact that certain substances are completely insoluble in either one of two solvents, but are easily soluble in mixtures of the two. A typical case is nitrocellulose, which cannot be dissolved in either ethanol or ethyl ether alone, but can be dissolved in ethanol-ether mixtures. Such solutions, of course, are obviously three-component systems.

Applications of Theory

If solutions of resins in organic solvents are also viewed as three-component systems (consisting of resin, organic solvent, and water), the apparent anomalies in their behavior can be readily understood. Regarded in this way, the solvent becomes not merely the organic solvent employed, but a mixture of this solvent with the water contained in the resin.

Support for the theory is offered by consideration of a few typical cases. For example, when a clear solution of shellac in acetone is diluted with more acetone, turbidity may result. Similar behavior may be observed when solutions of pontianak or manila in ethanol, or of the soft resin of shellac in ethyl ether, are diluted by addition of more solvent.

The result is difficult to explain if the system is regarded as a two-component one. However, if the system is viewed as consisting of three components — resin, organic solvent,

(*Continued on next page*)

Solox Recommended for Accounting Machine Inks

BINGHAMTON, N. Y.—Inks that leave a homogeneous, electrically conductive deposit suitable for closing circuits in accounting machines can be formulated from graphite, kaolin, glycerine, and Solox (U.S.I.'s proprietary general-purpose solvent).

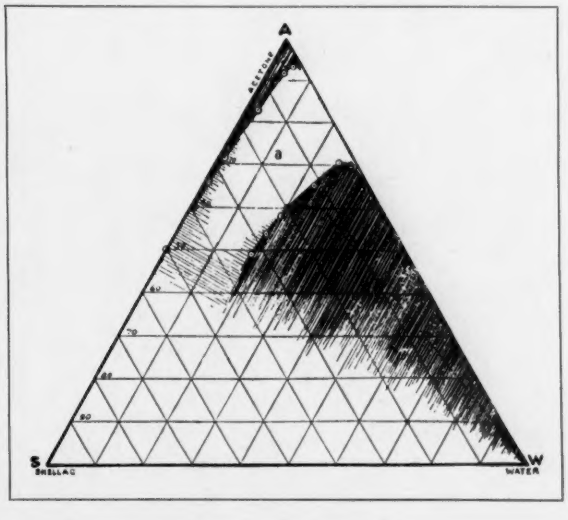
This discovery has been made by three inventors here, who have obtained a patent on the new inks. Conductive inks, the inventors point out, are used in many accounting machines to close electrical circuits. Control sheets printed with such inks are used over and over again, and the printed characters are subjected to repeated stresses caused by engagement with the electrical contact members of the machine. Under these conditions, the printed characters are easily mutilated.

Kaolin Improves Inks

These difficulties can be overcome, the inventors claim, by the use of their new inks. An important factor in the success of these inks is the incorporation of an inorganic filler, such as kaolin or bentonite, which gives more body to the inks, and thus results in a more homogeneous deposit.

A mixture of the filler and graphite is used with a hygroscopic polyhydric alcohol, such as glycerine or sorbitol, and a volatile solvent miscible with the polyhydric alcohol. This solvent may be a monohydric alcohol, and the patent papers suggest Solox as an example of a suitable solvent.

The effect of water on the behavior of solutions of resins in organic solvents is indicated in this three-component figure reproduced from the Journal of the Indian Chemical Society. The figure is represented on an equilateral triangle, and presents a picture of the mutual solubility relationship among shellac, acetone, and water. Dry de-waxed lemon shellac was used. Compositions in the blank portion "a" show complete solubility. Deeply shaded portions are heterogeneous. Lightly shaded portions represent the regions of gel formation. The effect of the presence of water is believed to explain certain anomalies in the behavior of resin solutions. A detailed explanation of the three-component theory is given in the accompanying article.



February ★ **U.S.I. CHEMICAL NEWS** ★ 1942

Gum and Carbon Deposits Removed by Use of Ethyl Acetate, Butyl Phthalate

CHICAGO, Ill.—Exceptional success in the removal of gum and carbon deposits in automotive engines has been attained with a mixture of ethyl acetate and butyl phthalate (dibutyl phthalate). Such a mixture is highly effective both for the removal of existing deposits, and as an additive agent in motor fuels to prevent formation of deposits. Moreover, the mixture is non-corrosive to metal parts.

These statements are set forth in a patent granted to inventors here and in Winnetka and Niles Center. In general, according to the patent, a suitable solvent mixture for the removal of gum and carbon deposits should consist of two ingredients: a compound boiling above 350° F. and having excellent gum-solvent properties at elevated temperatures; and a compound boiling below 350° F. and having good gum-solvent properties at ordinary temperatures. While a number of compounds meet these requirements, the butyl phthalate-ethyl acetate combination appears most effective.

Mineral Oil Vehicle

A white mineral oil is employed as a vehicle for the solvent mixture. When the solvent is employed for the removal of existing deposits, suitable proportions are:

	Parts by Volume
White Mineral Oil	20
Butyl Phthalate	40
Ethyl Acetate	40

When the solvent is employed as an additive in motor fuel, a higher proportion of mineral oil vehicle is desired. Suitable proportions are:

	Parts by Volume
White Mineral Oil	80
Butyl Phthalate	10
Ethyl Acetate	10

This mixture is added to gasoline in the ratio of 0.2 parts mixture to 99.8 parts gasoline.

Drug Trades Section Will Hold Banquet on March 12

The 17th Annual Banquet of the Drug, Chemical and Allied Trades Section of the New York Board of Trade will take place at the Waldorf-Astoria in New York on Mar. 12.

Net proceeds of the banquet this year will be donated to the American Red Cross.

View Water as Component In Dissolving of Resins

(Continued from previous page)

and water — it is obvious that the nature of the solvent mixture is changed by the addition of more of the organic component. The *relative* proportion of the water (contained in the resin) is decreased in the resulting solvent mixture. The resin apparently is less soluble in the new solvent mixture, thus giving rise to turbidity.

Additional Instances

The three-component theory offers an explanation of another peculiarity in the behavior of the solutions just described. When an apparently saturated solution of these resins in their respective solvents has been prepared (that is, when the solution refuses to take up undissolved resin) the addition of *more* resin may cause a further quantity of the resin to dissolve.

Since an increase in the resin content of such solutions results in a lower vapor pressure, it is impossible to explain this effect on thermodynamic grounds for a two-component system. If the system is viewed as consisting of three components, it is plain that the addition of more resin provides a larger amount of water for the solvent mixture.

As a further instance, the fact may be cited that it is frequently difficult to prepare *dilute* solutions of a resin in an organic solvent, but relatively easy to prepare a *concentrated* solution. For example, a 5% solution of shellac in acetone is difficult to make up, even by boiling, but a 30% to 40% solution is easily made up.

Further Evidence for Theory

Additional evidence for the validity of the theory may be found in the fact that *dried* resins do not show any of the effects already described. It may be noted that dry de-waxed lemon shellac is almost completely insoluble in water-free acetone. Addition of as little as 1 cc. of water to 100 cc. of acetone permits the solvent to take up as much as 40 grams of shellac, and the addition of 10 cc. of water will produce the lowest viscosity solutions for shellac concentrations of 25 - 35% of the total.

Of the resins used in the coatings industry, water appears to be an advantageous component of the solvent only for the alcohol-soluble resins such as shellacs and manilas. Most resins, on the other hand, dissolve better when both resins and solvents are entirely free from water.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A drying time recorder is applicable to measuring the set-to-touch, tack-free, and dry-hard times of paints and other finishes, according to the manufacturer. It is said that the test strips can be photographed to provide a permanent record. **(No. 540)**

U S I

Refined petroleum waxes now available are said to take the place of similar materials previously imported. Maker says that the waxes can be used in such diversified applications as waterproofing paper, rubber products, printing inks, shoe polish, and certain types of varnish. **(No. 541)**

U S I

A cleaning material is reported to be especially suitable for removing oil, grease, drawing compounds, and polishing materials from aluminum surfaces. Material is furnished in powdered form for solution in water, and is applied by immersion at temperatures of 170° to 212° F. **(No. 542)**

U S I

A corrosion-proofing liquid can be applied to metal by dipping, producing an almost water-white, tough, non-porous coating, it is claimed. Maker says that a film .001 inch thick has successfully withstood salt spray tests for 100 hours. **(No. 543)**

U S I

A black-out paint has been placed on the market for application to windows and skylights of industrial plants. Paint is marketed in paste form for application by brushing or spraying after the addition of water. It is said to dry in 40 minutes. For interior application, it can be covered with white paint to provide a better reflecting surface. **(No. 544)**

U S I

An all-purpose filter is said to be adaptable to any service from coarse free filtration to germ-proof ultra-filtration. It can be used with all types of filter media. Plates are so designed that filter medium forms a seal around the edges of the filter frames, preventing leakage and eliminating the need for rubber gaskets. **(No. 545)**

U S I

Warning of high temperatures is given by a new line of materials in convenient form. When the crayon is drawn across a surface, it leaves a chalk-like mark, which changes to a liquid streak when a predetermined temperature is reached. Crayons are available for temperature intervals from 125° to 1,600° F. **(No. 546)**

U S I

New industrial chemicals include sulfamic acid and ammonium sulfamate, until recently laboratory curiosities. Sulfamic acid is described as useful in leather tanning and in the manufacture of dyes and color lakes. Ammonium sulfamate is said to be an effective fire-retardant for textiles and paper. **(No. 547)**

U S I

Electroplated plastics are easily produced by a new process that is said to provide a firmly adherent, highly conductive bond coat on the surface of the plastic. Process is said to permit use of a relatively thin deposit of metal. **(No. 548)**

U S I

A flatting agent is described as especially suitable for use in lustreless army truck enamels. It is said that the relatively low oil absorption of the material permits the use of large quantities. **(No. 549)**

ping season, the fertilizer industry is better prepared to meet the demand of increased crop goals than it was in 1917-18," said Mr. Brand. "But this does not mean that there is an abundance of all fertilizer materials.

"It looks today like we could squeeze through the coming season with only minor shortages and although there must be some price increases as time passes on they will not take on the extremes experienced in the last World War with its pronounced shortages of fertilizer materials," he declared.

"There is an adequate supply of potash. During the Great War we were entirely dependent upon foreign sources for this material. Today the American potash industry, built during the past 25 years, can produce what we need.

"The demands of munitions upon the nitrogen industry are enormous, but we now have three great synthetic nitrogen plants, and others on a smaller scale are beginning to produce or are in the process of building. We have a higher by-product sulfate of ammonia production than we had 25 years ago.

"Nitrates can be brought from Chile, though the number of ships available for this operation presents an ever-changing problem. It is expected that allocation which OPM has made of the available portion of the national supply of sodium nitrate for agriculture will afford an equitable distribution of it among various companies and various regions. It appears that there will not be enough nitrate of soda to go around and that supplies of sulfate of ammonia, Cyanamid, and Uramon will not be sufficient to make up the deficiency in nitrogen for top-dressing and side-dressing, where some shortages will exist. These, however, will not be severe if good distribution is accomplished.

"We have an abundant supply of phosphate rock for the manufacture of superphosphate and ample mining capacity for more. However, the future demands of war industry for sulfuric acid, which is used in making superphosphate, may cause some shortage in this material. It is hoped, however, that it will not be great.

"Already the Government has earmarked two-thirds of the burlap supply for use in sand bags and for other war purposes. The bag situation is serious. We have been asked by defense agencies to urge that all second-hand bags be conserved and reused wherever possible giving preference to superior uses. It appears that very little more burlap or osnaburg than that on hand in fertilizer factories will be available for this season. However, it is reported that sufficient paper bags have been allocated to the industry to make up the shortage. In the circumstances, manufacturers should supply themselves with paper bags.

"Increases in transportation costs, labor, and expenses incident to wartime adjustments probably will occasion some price rises. These should be only in proportion to the additional costs and difficulties of wartime production."

Paint Materials: Sales of paint, varnish, lacquers and fillers established a new high record during 1941, according to the Department of Commerce. Total sales reported by 579 manufacturers amounted to $533,596,942 during 1941 as compared with $396,622,786 in 1940. All forms of cobalt were placed under strict allocations Feb. 6 restricting use to 40% until May 1, after which time the use in pigments will be banned entirely. Other basic metals which are imported and used by the paint industry may soon come under the same restrictions. Production of domestic casein this year is not expected to be large because of government demands for milk. Argentine production also is reported to be under the usual figures. Lithopone price schedule effective Feb. 2 brought many complaints from exporters of the material. Price action, however, was taken to discourage the exportation of this material which is needed urgently for home use. Producers of dry white lead announced higher prices Jan. 30 with advances of ¾ cent a pound. Dry and chemical color producers are requesting an advance in prices because of the recent increase in pig lead prices.

Heavy Chemicals, Coal-Tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated. Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 - Jan. 1942 $0.98

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Acetaldehyde, 99%, 55, 110 gal drs, wks ....lb.	...	.11	.11	.11	.11	.11
Acetaldol (Aldol), 55, 110 gal drs, c-l, wks ....lb.	...	.12	.12	.12	.11	.13
Acetamide, tech, kgs, wks .lb.	.28	.45	.28	.45	.28	.45
Acetanilid, tech, cryst, bbls ....lb.	.29	.31	.29	.31	.29	.31
powd, bbls ....lb.	.27	.29	.27	.29	.27	.29
Acetic Anhydride, drs, c-l, frt all'd ....lb.	.11½	.13	.11½	.13	.10½	.13
Acetin, tech, lcl drs .....lb.	...	.29	.29	.29	.29	.33
Acetone, tks, delv (*PC*) ..lb.	.07	.158	.07	.158	.06	.158
drs, c-l, delv (*PC*) ....lb.	.08½	.173	.08½	.173	.07½	.173
Acetonitrile, drs, wks ...lb.	1.00	2.00	1.00	2.00	1.00	2.00
Acetophenone, drs ....lb.	1.55	1.60	1.55	1.60	1.55	1.60
Acetophenetidin, bbls, kgs, 1000 lbs ....lb.	...	1.00	1.00	1.00	1.00	1.00

ACIDS

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Acetic, 28%, bbls (*PC*) 100 lbs.	3.38	3.63	3.38	3.63	2.23	3.43
glacial, nat, bbls ..100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
synth, drs ....100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
tks, wks ....100 lbs.	6.25	6.93	6.25	6.93	...	...
Acetylsalicylic, USP, special, 200 lb bbls ....lb.	...	.45	.45	.45	.45	.45
Standard USP ....lb.	...	.40	.40	.40	.40	.40
Adipic, fib drs, wks .....lb.	...	.31	.31	.31	.31	.31
Anthranilic, ref'd bbls ...lb.	1.20	1.25	1.20	1.25	1.15	1.20
tech, bbls ....lb.	...	.95	.95	.95	.75	.95
Ascorbic, bots, drs ....oz.	1.65	1.85	1.65	1.85	1.85	2.10
Battery, cbys, wks ..100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic, tech, bbls ......lb.	.43	.47	.43	.47	.43	.47
USP, bbls ....lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, frt all'd bgs 50 tons ....ton *a*	...	99.00	99.00	99.00	93.50	99.50
bbls ....ton *a*	...	108.00	108.00	108.00	108.00	108.00
Broenner's, bbls ....lb.	...	1.11	1.11	1.11	1.11	1.11
Butyric, c-l drs, wks .....lb.	...	.22	.22	.22	.22	.22
tks, wks ....lb.	...	.21	.21	.21	.21	.21
Caproic, drs, wks ....lb.	.25	.30	.25	.30	.25	.30
Chlorosulfonic, drs, wks ..lb.	.03	.04½	.03	.04½	.03½	.05
tks, wks ....lb.	...	.02½	.02½	.02½	...	...
Chromic, drs (*FP*) ......lb.	.16¼	.18¼	.16¼	.18¼	.15¼	.17¼
Citric, crys, gran, bbls ..lb. *b*	.20	.21	.20	.21	.20	.21
Anhyd gran, drs ....lb.	.23	.26½	.23	.26½	.23	.26½
Cleve's bbls ....lb.	...	.65	.65	.65	.65	.65
Cresylic 50%, 210-215° HB, drs, wks, frt equal (A) gal.	.81	.86	.81	.86	.76	.84
Low Boiling ....gal.	.81	.86	.81	.86	.76	.84
Formic, tech, cbys ....lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls ....lb.	.27	.31	.27	.31	.24	.29
Gallic, tech, bbls ....lb.	1.10	1.13	1.10	1.13	.90	1.13
NF bbls ....lb.	1.27	1.30	1.27	1.30	1.10	1.30
H, bbls wks ....lb.	...	.45	.45	.45	.45	.45
Hydrochloric, see muriatic						
Hydrocyanic cyls, wks ...lb.	.80	1.00	.80	1.00	.80	1.00
Hydrofluoric, 30%, bbls, wks ....lb.	.06	.06½	.06	.06½	.06	.06½
Hydrofluosilic, 35%, bbls lb.	.09	.09½	.09	.09½	.09	.09½
Lactic, 22% dark, bbls ...lb.	.029	.035	.029	.035	.02½	.035
22%, light, bbls wks ...lb.	.039	.0415	.039	.0415	.03½	.0415
44%, dark, bbls wks ...lb.	.063	.0655	.063	.0655	.05½	.0655
44%, light, bbls wks ...lb.	.073	.0755	.073	.0755	.06½	.073
Lauric, dist, tech, drs ....lb.	.20	.20½	.20	.20½	.15	.18¾
Laurent's bbls ....lb.	...	.45	.45	.45	.45	.45
Maleic, powd, drs ....lb.	...	.30	.30	.30	.30	.30
Anhydride, drs ....lb.	.25	.26	.25	.26	.25	.26
Malic, powd, kgs ....lb.	...	.47	.47	.47	.47	.47
Mixed, tks N unit ....lb.	.05	.06	.05	.06	.05	.06
S unit ....lb.	.0085	.009	.0085	.009	.0085	.009
Molybdic, kgs, wks ......lb.	.95	1.10	.95	1.10	.95	1.10
Monochloracetic, tech, bbls ....lb.	...	.17	.17	.17	.15	.18
Monosulfonic, bbls ....lb.	...	1.50	1.50	1.50	1.50	1.50
Muriatic, 18° cbys, c-l wks ....100 lb.	...	1.50	1.50	1.50	1.50	1.50
tks, wks ....100 lb.	...	1.05	1.05	1.05	1.05	1.05
20° cbys, c-l, wks ..100 lb.	...	1.75	1.75	1.75	1.75	1.75
tks, wks ....100 lb.	...	1.15	1.15	1.15	1.15	1.15

a Powdered boric acid $5 a ton higher; USP $25 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; *y* Price given is per gal.

(*A*) Allocations. (*FP*) Under full priority control. (*PC*) Under price ceiling.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Acid (continued):						
22° cbys, c-l, wks ..100 lb.	...	2.25	2.25	2.25	2.25	2.25
tks, wks ....100 lb.	...	1.65	1.65	1.65	1.65	1.65
CP cbys ....lb.	.06½	.08	.06½	.08	.06½	.08
Myristic, dist, drs ....lb.	.18	.18½	.18	.18½	.18	.18½
Naphthenic drs, 220-230 ..lb.	...	.10	.10	.10	.10	.10
tks, wks ....lb.	...	.09	.09	.09	.09	.09
Naphthionic, tech, bbls ...lb.	.60	.65	.60	.65	.60	.65
Nicotinic cns ....lb.	...	7.15	7.15	7.15	7.15	7.15
Nitric, 36°, cbys, c-l, wks ....100 lbs. *c*	...	5.00	5.00	5.00	5.00	5.00
38°, c-l, cbys, wks 100 lbs. *c*	...	5.50	5.50	5.50	5.50	5.50
40°, c-l, cbys, wks 100 lbs. *c*	...	6.00	6.00	6.00	6.00	6.00
42°, c-l, cbys, wks 100 lbs. *c*	...	6.50	6.50	6.50	6.50	6.50
CP, cbys ....lb.	.11½	.13	.11½	.13	.11½	.13
Oxalic, bbls, wks ....lb.	.11¼	.14½	.11¼	.14½	.11½	.14¼
Phosphoric, 85% USP, cbys ....lb.	...	.12	.12	.12	.12	.12
50% food grade, c-l, bbls, wks, frt equal ..100 lbs.	4.00	4.25	4.00	4.25	4.00	4.25
Picramic, kgs ....lb.	.65	.70	.65	.70	.65	.70
Picric, bbls, wks ....lb.	...	.35	.35	.35	.35	.35
Propionic, pure, drs, wks lb.	...	.14	.14	.14	.14	.14
tks, wks ....lb.	...	.11	.11	.11	.11	.11
Pyrogallic, tech, lump, pwd, bbls ....lb.	...	1.45	1.45	1.45	1.45	1.45
USP, cryst, cns .....lb.	...	2.10	2.10	2.10	1.70	2.25
Pyroligneous, bbls, delv gal.	...	.25	.25	.25	.25	.25
Ricinoleic, tech, drs, wks lb.	.32	.37	.32	.37	.32	.37
Salicylic, tech, 125 lb bbls, wks ....lb.	...	.33	...	.33	...	.33
USP, bbls ....lb.	.35	.38	.35	.38	.35	.40
Sebasic, tech, bbls, wks ..lb.	...	.82	.82	.82	.82	.82
Stearic, see under Oils & Fats						
Succinic, bbls ....lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb drs, wks lb.	...	.17	...	.17	...	.17
Sulfuric, 60°, tks, wks ..ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks ....100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks ....ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks ....100 lb.	...	1.50	...	1.50	...	1.50
CP, cbys, wks ....lb.	.06½	.08	.06½	.08	.06½	.08
Fuming (Oleum) 20% tks, wks ....ton	...	19.50	...	19.50	18.50	19.50
Tannic, tech, 300 lb bbls ..lb.	.71	.73	.71	.73	.54	.73
Tartaric, USP, gran, powd, 300 lb bbls ....lb.	...	.70½	...	.70½	.46¼	.70½
Tobias, 250 lb bbls ......lb.	.55	.60	.55	.60	.55	.60
Trichloroacetic bottles ...lb.	2.00	2.50	2.00	2.50	2.00	2.50
Tungstic, pure, 100 lb pkg. lb.	...	2.86	...	2.86	no prices	
Acrylonitrile, tks ....lb.	...	.34	.34	.34	...	...
Albumen, light flake, 225 lb bbls ....lb.	.65	.75	.65	.75	.55	.75
dark, bbls ....lb.	.12½	.14	.12½	.14	.13	.18
egg, edible ....lb.	1.80	1.85	1.80	1.85	.65	1.85
Alcohol, Amyl (from Pentane) tks, delv ....lb.	...	.131	...	.131	.111	.131
c-l, drs, delv ....lb.	...	.141	...	.141	.121	.141
lcl, drs, delv ....lb.	...	.151	...	.151	.131	.151
Amyl, normal lcl drs Wyandotte, Mich. .....lb.	...	.27	...	.27	.25	.27
secondary, tks, delv ....lb.						
drs, c-l, delv E of Rockies ....lb.	...	.09½	...	.09½	...	.09½
tertiary, rfd, lcl, drs, f.o.b., Wyandotte, frt all'd ....lb.	...	.09	...	.09	...	.09
Benzyl, cans ....lb.	.65	.75	.65	.75	.65	.75
Butyl, normal, tks, f.o.b. wks, frt all'd (*PC*) ..lb.	.12½	.158	.12½	.158	.09	.158
c-l, drs, f.o.b. wks, frt all'd ....lb.	.13½	.168	.13½	.168	.10	.168
Butyl, secondary, tks, delv ....lb.	...	.08½	...	.08½	.07¼	.08½
c-l, drs, delv ....lb.	...	.09½	...	.09½	.08¼	.09½
Butyl, tert denat c-l drs lb.	...	.12½	...	.12½	...	.12½
lcl drs ....lb.	...	.13	...	.13	...	.13
tks ....lb.	...	.11½	...	.11½	...	.11½
Capryl, drs, crude, wks lb.	...	.16	...	.16	...	.16
Cinnamic, bottles ......lb.	3.00	3.60	3.00	3.60	2.33	3.60
Denatured, CD, 14, c-l drs, wks (*PC*, *FP*) gal.	...	.65	...	.65	.36½	.45½
tks, East, wks ......gal.	...	.58	...	.58	.26½	.58
Denatured, SD, No. 1, tks,	...	.53	...	.53	.28½	.53

c Yellow grades 25c per 100 lbs. less in each case. *d* Prices given are Eastern schedule; Territories other east of Rockies and 15½c per gal. less than Eastern Works price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Alcohols (continued):						
Diacetone, pure, c-l drs, delv lb. *f*	.11½	.13	.11½	.13	.09½	.13
tks, delv lb.	.10½	.13½	.10½	.13½	.10½	.13½
tech, contract, drs, c-l, delv lb.	.11	.12	.11	.12	.09	.12
tks, delv lb.	.10	.12½	.10	.12½	.10	.12½
Ethyl, 190 proof molasses, tks gal. *g*	...	8.12	...	8.12	5.96½	8.12
c-l, drs gal. *g*	...	8.19	...	8.19	6.02½	8.19
c-l, bbls gal. *g*	...	8.25	...	8.25	6.03½	8.25
Furfuryl, tech, 500 lb. drs lb.	.20	.25	.20	.25	.20	.25
Hexyl, secondary tks, delv lb.	...	.23	...	.23	.12	.23
c-l, drs, delv lb.	...	.24	...	.24	...	.13
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	.32
drs, lcl, delv lb.	...	.22½	...	.22½	.22½	.27
Isobutyl, ref'd, lcl, drs lb.	...	.086	...	.086	.079	.086
c-l, drs lb.	...	.076	...	.076	.069	.076
tks lb.	...	.076	...	.076	.069	.076
Ethylhexyl, tks, wks lb.	.23	.23	.23	.23	.23	.23
Isopropyl, ref'd, 91% drs, frt all'd gal.	.40½	.43½	.40½	.43½	.40½	.43½
tks, frt all'd gal.	...	.34	.34	.34	.34	.34
99%, drs, frt all'd gal.	.44	.47	.44	.47	.44	.47
tks, frt all'd gal.	...	.37½	.37½	.37½	.37½	.37½
Octyl, see Ethylhexyl						
Polyvinyl A fib drs lb.	...	.54	.54	.54	.26	.54
B fib drs lb.	.65	.70	.65	.70	...	...
Propyl, nor, drs, wks gal.	.69	.75	.69	.75	...	...
Spec Solvents, East, drs, wks gal.	.67	.70	.67	.70	...	...
tks, East, wks gal.	.61	.66	.61	.66	...	...
Tetrahydrofurfuryl drs, f.o.b. wks lb.	.44	.50	.44	.50	...	...
Aldehyde ammonia, 100 gal drs lb.	.65	.70	.65	.70	.65	.70
Aldehyde Bisulfite, bbls, delv lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv lb.	.12	.15	.12	.15	.11	.15
Alphanaphthol, crude, 300 lb bbls lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls lb.	...	.32	...	.32	...	.32
Alum, ammonia, lump, c-l, bbls, wks 100 lb.	...	4.25	..	4.25	3.75	4.25
delv NY, Phila 100 lb.	...	4.25	...	4.25	3.75	4.25
Granular, c-l, bbls wks 100 lb.	...	4.00	...	4.00	3.50	4.00
Powd, c-l, bbls, wks 100 lb.	...	4.40	...	4.40	3.90	4.40
Potash, lump, c-l, bbls, wks 100 lb.	...	4.50	...	4.50	4.00	4.50
Granular, c-l, bbls, wks 100 lb.	...	4.25	...	4.25	3.75	4.25
Powd, c-l, bbls, wks 100 lb.	...	4.65	...	4.65	4.15	4.65
Soda, bbls, wks 100 lb.	...	3.25	...	3.25	.	3.25
Chrome, bbls 100 lb.	.12½	.15	.12½	.15	no prices	
Aluminum metal, c-l, (*FP*) 100 lb.	15.00	16.00	15.00	16.00	17.00	18.00
Acetate, 20%, nor sol, bbls lb.	.10½	.11	.10½	.11	.10½	.11
Basic powd, bbls, delv lb.	.40	.50	.40	.50	.35	.50
24% sol, bbls, delv lb.	.10½	.11	.10½	.11	.09½	.12
Chloride anhyd 99% wks lb.	.08	.12	.08	.12	.08	.12
Crystals, c-l, drs, wks lb.	.06	.06½	.06	.06½	.06	.06½
Solution, drs, wks lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv lb.	.13	.15	.13	.15	.13	.15
Hydrate, 96%, light, 90 lb. bbls, delv lb.	...	.14½	...	.14½	.12½	.14½
heavy, bbls, wks lb.	...	.034	...	.034	.029	.03½
Oleate, drs lb.	.17½	.20	.17½	.20	.17½	.20
Palmitate, bbls lb.	.25	.26	.25	.26	.20½	.26
Resinate, pp., bbls lb.	...	.15	...	.15	.	.15
Searate, 100 lb bbls lb.	...	.23	...	.23	.18	.23
Sulfate, com, c-l, bgs, wks 100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
c-l, bbls, wks 100 lb.	1.35	1.45	1.35	1.45	1.35	1.45
Sulfate, iron-free, c-l, bgs, wks 100 lb.	1.75	1.85	1.75	1.85	1.60	1.85
c-l, bbls, wks 100 lb.	1.95	2.05	1.95	2.05	1.80	2.10
Ammonia anhyd fert com, tks lb.	.04½	.05	.04½	.05	.04½	.05
Ammonia anhyd, 100 lb cyl lb.	...	.16	...	.16	...	.16
26°, 800 lb drs, delv lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH_2 cont.	...	.08z	...	.08z	.04	.05¼
Ammonium Acetate, kgs lb.	.27	.33	.27	.33	.27	.33
Bicarbonate, bbls, f.o.b. wks 100 lb	.0564	.0614	.0564	.0614	.0564	.0614
Bifluoride, 300 lb bbls lb.	.15½	.18	.15½	.18	.14	.18
Carbonate, tech, 500 lb bbls lb.	.08¼	.09¼	.08¼	.09¼	.08¼	.09¼
Chloride, White, 100 lb. bbls, wks 100 lb.	4.45	...	4.45	...	4.45	...
Gray, 250 lb bbls, wks 100 lb.	5.50	5.75	5.50	5.75	5.50	5.75
Lactate, 500 lb bbls lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls lb.	...	.12	...	.12	...	.12
Nitrate, tech, bgs, bbls lb.	.0435	.0455	.0435	.0455	.0435	.0455
Oleate, drs lb.	...	.14	...	.14	...	.14
Oxalate, neut, cryst, powd, bbls lb.	.23	.29	.23	.29	.19	.29
Perchlorate, kgs lb.	.55	.65	.55	.65	.55	.65
Persulfate, 112 lb kgs lb.	.21	.23	.21	.23	.21	.22

z On a f.o.b. wks. basis.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Ammonium (continued):						
Phosphate, diabasic tech, powd, 325 lb bbls lb.	.07¼	...	.07¼	...	.07¼	.09¼
Ricinoleate, bbls lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls lb.	...	.24½	...	.24½	...	.24½
Paste, bbls lb.	...	.06½	...	.06½	...	.06½
Sulfate, dom, f.o.b., bulk ton	29.00	30.00	29.00	30.00	29.00	30.00
Sulfocyanide, pure, kgs lb.	.45	.55	.45	.55	.45	.65
Amyl Acetate (from pentane)						
tks, delv lb.	...	.145	...	.145	.105	.145
c-l, drs, delv lb.	...	.155	...	.155	.115	.155
lcl, drs, delv lb.	...	.165	...	.165	.125	.165
tech drs, ex-fusel oil delv lb.	...	.14½	...	.14½	...	.14½
Secondary, tks, delv lb.	...	.08½	...	.08½	...	.08½
c-l, drs, **delv** lb.	...	.09½	...	.09½	...	.09½
tks, delv lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, **drs, wks** lb.	.56	.68	.56	.68	.56	.68
mixed l c l **drs, wks** lb.	...	.08	...	.08	.0565	.08
tks, wks lb.	...	.06	...	.06	.0465	.06
Amyl Ether (see Diamyl						
lcl, dms lb.	...	.102	...	.102	...	...
cl, dms lb.	...	.095	...	.095	...	...
tks lb.	...	.085	...	.085	...	...
Mercaptan, **drs, wks** lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, **wks, drs** lb.	...	.31	...	.31	.25	.31
Stearate, lcl, **wks, drs** lb.	...	.32½	...	.32½	.26	.335
Amylene, drs, wks lb.	.102	.11	.102	.11	.102	.11
tks, wks lb.	...	.09	...	.09	...	.09
Amylnaphthalenes, see Mixed Amylnaphthalenes						
Aniline Oil, 960 lb drs and tks lb.	...	.14½	...	.14½	...	.14½
Annatto fine lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80-85% lb.	...	.55	...	.55	...	.55
Anthraquinone, sublimed, 125 lb bbls lb.	...	.70	...	.70	.65	.70
Antimony metal slabs, ton lots lb.	.14	nom.	.14	nom.	.14	.16½
Butter of, see Chloride						
Chloride, **soln, cbys** lb.	...	.17	...	.17	...	.17
Needle, **powd, bbls** lb.	.18½	.20	.18½	.20	.16	.18
Oxide, **500 lb bbls** lb.	.15	.16½	.15	.16½	.12	.16½
Salt, 63% to 65%, drs lb.	...	.34	...	.34	.28	.34
Archil, conc, 600 lb bbls lb.	...	.26	...	.26	no prices	
Aroclors, wks lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls lb.	.10¼	.10¾	.10¼	.10¾	.09½	.10¾
Arsenic, Metal lb.	no prices		no prices		no prices	
Red, 224 lb cs kgs lb.	no prices		no prices		no prices	
White, 112 lb kgs lb.	.04	.04¾	.04	.04¾	.03½	.04¾

B

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Barium Carbonate precip, 200 lb bgs, wks ton	55.00	65.00	55.00	65.00	45.00	65.00
Nat (witherite) 90% gr, c-l, wks, bgs ton	...	43.00	...	43.00	...	43.00
Chlorate, 112 lb kgs, NY lb.	...	.60	...	.60	...	.45
Chloride, 600 lb bbls, delv, zone 1 ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs lb.	...	.10	...	.10	...	.10
Hydrate, 500 lb bbls lb.	.06	.07	.06	.07	.05½	.07
Nitrate, bbls lb.	.10½	.12½	.10½	.12½	.08½	.12½
Barytes, floated, 350 lb bbls c-l, wks ton	...	27.65	...	27.65	25.15	27.65
Bauxite, bulk, mines ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks ton	...	16.00	...	16.00	...	16.00
200 mesh ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal.	...	.15	...	.15	.14	.15
90% c-l, drs gal.	...	.20	...	.20	.19	.20
Ind pure, tks, frt all'd gal.	...	.15	...	.15	.14	.15
Benzidine Base, dry, 250 lb. bbls lb.	...	.70	...	.70	...	.70
Benzoyl Chloride, 500 lb drs lb.	.23	.28	.23	.28	.23	.28
Benzyl Chloride, 95-97% rfd, drs lb.	.22	.24	.22	.24	.19	.24
Beta-Naphthol, 250 lb bbls, wks lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls lb.	1.25	...	1.25	...	1.25	1.35
Tech, 200 lb bbls lb.	...	.51	...	.51	.51	.52
Bismuth metal lb.	...	1.25	...	1.25	...	1.25
Chloride, boxes lb.	...	3.00	...	3.00	3.00	3.25
Hydroxide, boxes lb.	3.35	3.46	3.35	3.46	3.35	3.46
Oxychloride, boxes lb.	3.10	3.19	3.10	3.19	3.10	3.19
Subbenzoate, boxes lb.	...	3.40	...	3.40	...	3.40
Subcarbonate, kgs lb.	1.59	1.85	1.59	1.85	1.59	1.85
Subnitrate, fibre, drs lb.	1.29	1.57	1.29	1.57	1.20	1.57
Trioxide, powd, boxes lb.	...	3.65	...	3.65	...	3.65
Blanc Fixe, Pulp, 400 lb. bbls, wks ton *h*	40.00	46.50	40.00	46.50	35.00	46.50
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.	2.25	3.10	2.25	3.10	2.00	3.10
lcl, drs, wks lb.	2.50	3.35	2.50	3.35	2.25	3.35
Blood, dried, f.o.b., NY unit	...	5.25	...	5.25	4.75	5.25
Chicago, high grade unit	...	5.40	...	5.40	5.00	5.40
Imported shipt unit	...	5.00	...	5.00	4.75	5.00
Blues, Bronze Chinese						
Prussian Soluble lb.	...	.36	...	.36	.33	.36
Milori, bbls lb.	...	.36	...	.36	.33	.36
Ultramarine,* dry, wks, bbls lb.	...	.11	...	.11	...	.11
Regular grade, group 1 lb.	.16	.27	.16	.27	.16	.20
Pulp, Cobalt grade lb.	.22	.24	.22	.24	.22	.24

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

Prices Current

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Bone, 4½ + 50% raw, Chicago ....ton	39.00	40.00	39.00	40.00	30.00	40.00
Bone Ash, 100 lb kgs ....lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50% imp ton	...	37.50	...	37.50	31.50	37.50
Domestic, bgs, Chicago ton	38.00	40.00	38.00	40.00	32.00	40.00
Borax, tech, gran, 80 ton lots, bgs, delv ....ton *i*	...	45.00	...	45.00	43.00	45.00
bbls, delv ....ton *i*	...	54.00	...	54.00	53.00	56.00
Tech, powd, 80 ton lots, bgs ....ton	...	50.00	...	50.00	48.00	50.00
bbls, delv ....ton	...	59.00	...	59.00	58.00	61.00
Bordeaux Mixture, drs ...lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases ....lb.	.25	.30	.25	.30	.25	.30
Bronze, Al, pwd, 300 lb drs (*FP*) ....lb.	...	.59	...	.59	...	.57
Gold, blk ....lb.	.60	.65	.60	.65	.60	.65
Butanes, com 16-32° group 3 tks ....lb.	...	.02½	...	.02½	.02½	.03
Butyl, acetate, norm drs, frt all'd ....lb.	.14½	.168	.14½	.168	.10	.168
tks, frt all'd ....lb.	.13½	.158	.13½	.158	.09	.158
Secondary, tks, frt all'd lb.	...	.08½	...	.08½	.07¼	.08½
drs, frt all'd ....lb.	...	.09½	...	.09½	.08¾	.09½
Aldehyde, 50 gal drs, wks ....lb.	.15½	.17½	.15½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)						
Chloride, normal lcl, drs ....lb.	...	.35	.28	.35	...	...
c-l, drs ....lb.	...	.32	.25	.32	...	...
Crotonate, norm, 55 and 110 gal drs, delv ....lb.	...	.35	...	.35	...	.35
Lactate ....lb.	...	.26½	...	.26½	...	.23½
Oleate, drs, frt all'd ...lb.	...	.25	...	.25	...	.25
Propionate, drs ....lb.	.16½	.17	.16½	.17	.16½	.17
tks, delv ....lb.	...	.15½	...	.15½	...	.15½
Stearate, 50 gal drs ....lb.	...	.31	...	.31	.28½	.32½
Tartrate, drs ....lb.	no prices		no prices		.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	...	.35½

C

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Cadmium Metal ....lb.	.90	.95	.90	.95	.80	.95
Sulfide, orange, boxes ..lb.	...	1.10	...	1.10	...	1.10
Calcium, Acetate, 150 lb bgs c-l, delv ....100 lb.	3.00	4.00	3.00	4.00	1.90	4.00
Arsenate, c-l, E of Rockies, dealers, drs ....lb.	.06½	.07½	.06½	.07½	.06	.07½
Carbide, drs ....lb.	...	.04¾	...	.04¾	...	.04¾
Carbonate, tech, 100 lb bgs, c-l ....ton	16.00	20.00	16.00	20.00	16.00	20.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv ton	...	21.00	...	21.00	...	20.50
paper bgs, c-l, delv ton	18.50	41.00	18.50	41.00	18.50	35.00
Solid, 650 lb drs, c-l, delv ....ton	18.00	34.50	18.00	34.50	18.00	34.50
Ferrocyanide, 350 lb bbls wks ....lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls ....lb.	.52	.59	.52	.59	.52	.59
Levulinate, less than 25 bbl lots, wks ....lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bgs ....ton	no prices		no prices		no prices	
Palmitate, bbls ....lb.	.28	.29	.28	.29	.22	.29
Phosphate, tribasic, tech, 450 lb bbls ....lb.	.0635	.0705	.0635	.0705	.0635	.0705
Resinate, precip, bbls ..lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls ...lb.	.26	.27	.26	.27	.20½	.27
Camphor, slabs ....lb.	1.60	1.65	1.60	1.65	.73	1.65
Powder ....lb.	1.60	1.65	1.60	1.65	.63	1.65
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, f.o.b. plants ....lb.	...	.03625	...	.03625	.03325	.0342
Decolorizing, drs, c-l ..lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq, 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, (*FP*), 55 or 110 gal drs, c-l, delv lb.	...	.73	...	.73	.66½	.73
Casein, Standard, Dom, grd lb.	.30	.30½	.30	.30½	.11½	.31
80-100 mesh, c-l bgs ...lb.	.30½	.31	.30½	.31	.12	.31½
Castor Pomace, 5½ NH_3, c-l, bgs, wks ....ton	...	16.00	...	16.00	15.00	16.00
Imported, ship, bgs ....ton	no prices		no prices		no prices	
Celluloid, Scraps, ivory cs lb.	.13	.15	.13	.15	.12	.15
Transparent, cs ....lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, frt all'd, 50 lb kgs ....lb.	...	.30	...	.30	...	.30
Triacetate, flake, frt all'd ....lb.	...	.30	...	.30	...	.30
Chalk, dropped, 175 lb bbls lb.	...	.02⅞	...	.02⅞	.02¾	.02⅞
Precip, heavy, 560 lb cks ....100 lbs.	...	32.50	32.50	32.50	32.50	32.50
Charcoal, Hardwood, lump, blk, wks ....bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ..ton	25.00	36.00	25.00	36.00	25.00	36.00
Willow, powd, 100 lb bbls, wks ....lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified tks, wks lb.	...	.0225	...	.0225	.01¾	.0275
25%, bbls, wks ....lb.	...	.0275	...	.0275	.0240	.0275
China Clay, c-l, blk mines ton	...	7.60	...	7.60	...	7.60
Imported, lump, blk ...ton	18.60	23.00	18.60	23.00	18.60	...
Chlorine, cyls, lcl, wks, contract (*FP*) ....lb.	...	.07¼	...	.07¼	...	.07¼
cyls, c-l, contract ...lb. *j*	...	.05¼	...	.05¼	...	.05¼
Chlorine (continued): Liq, tk, wks, contract 100 lb.	...	1.75	...	1.75	...	1.75
Multi, c-l, cyls, wks, cont ....lb.	...	2.00	...	2.00	1.90	2.00
Chloroacetophenone, tins, wks ....lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb. drs, lcl, wks ....lb.	...	.08	...	.08	.06	.08
Chloroform, tech, 650 lb drs ....lb.	...	.20	...	.20	...	.20
USP, 650 lb drs ....lb.	...	.30	...	.30	...	.30
Chloropicrin, comml cyls ..lb.	...	.80	...	.80	...	.80
Chrome, Green, CP ....lb.	.23	.33	.23	.33	.21	.25
Yellow ....lb.	.16	.17	.16	.17	.13½	.14½
Chromium Acetate, 8% Chrome, bbls ....lb.	.07¾	.08½	.07¾	.08½	.07¾	.08½
Fluoride, powd, 400 lb bbls ....lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls ....bbl.	7.50	7.75	7.50	7.75	7.50	7.75
Cobalt Acetate, bbls (A) lb.	...	.83¾	...	.83¾	.80½	.83¾
Carbonate tech, bbls (A) lb.	...	1.58	...	1.58	...	1.58
Hydrate, bbls (A) ....lb.	...	2.04	...	2.04	1.98	2.04
Linoleate, solid, bbls ...lb.	...	.42	...	.42	.33	.42
paste, 5%, drs ...lb.	...	.31	...	.31	...	.31
Oxide, black, bgs (A) ..lb.	...	1.84	...	1.84	...	1.84
Resinate, fused, bbls ...lb.	...	.13½	...	.13½	...	.13½
Precipitated, bbls ...lb.	...	.34	...	.34	...	.34
Cochineal, gray or bk bgs lb.	.37	.38	.37	.38	.37	.38
Teneriffe silver, bgs ...lb.	.38	.39	.38	.39	.38	.39
Copper, metal *FP*, *PC* 100 lb.	12.00	12.50	12.00	12.50	12.00	12.50
Acetate, normal, bbls, delv ....lb.	.24	.26	.24	.26	.22	.26
Carbonate, 52-54% 400 lb bbls ....lb.	.18	.20½	.18	.20½	.1650	.20½
Chloride, 250 lb bbls ..lb.	...	.19½	...	.19½	.16	.19½
Cyanide, 100 lb drs ....lb.	.34	.38	.34	.38	.34	.38
Oleate, precip, bbls ...lb.	...	.20	...	.20	...	.20
Oxide, black, bbls, wks lb.	.19½	.21	.19½	.21	.18	.21
red 100 lb bbls ....lb.	.20	.22	.20	.22	.19	.22
Sub-acetate verdigris, 400 lb bbls ....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks, 100 lb.	5.15	5.50	5.15	5.50	4.75	5.50
Copperas crys and sugar bulk c-l, wks ....ton	...	17.00	...	17.00	14.00	17.00
Corn sugar, tanners, bbls 100 lb.	...	4.05	...	4.05	3.36	4.05
Corn Syrup, 42°, bbls 100 lb.	...	3.52	...	3.52	3.42	3.52
43°, bbls ....100 lb.	...	3.57	...	3.57	3.47	3.57
Cotton, Soluble, wet 100 lb bbls ....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls ....lb.	...	.57½	...	.57½	.38¼	.57½
Creosote, USP 42 lb cbys lb.	.60	.77	.60	.77	.45	.77
Oil, Grade 1 tks ....gal.	...	.15½	...	.15½	.13½	.15½
Grade 2 ....gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs, c-l ....lb.	.11	.11¼	.11	.11½	.09¾	.11¼
Crotonaldehyde, 97%, 55 and 110 gal drs, wks ....lb.	...	.15	...	.15	.11	.15
Cutch, Philippine, 100 lb bale lb	...	.05¼	...	.05¼	.04¾	.05¼
Cyanamid, pulv, bgs, c-l, frt all'd, nitrogen basis, unit	no prices		no prices		...	1.40

D

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Derris root 5% rotenone, bbls ....lb.	.40	.41	.40	.41	.21	.40
Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb.	...	4.00	...	4.00	3.80	4.00
British Gum, bgs ...100 lb.	...	4.25	...	4.25	4.05	4.25
Potato, Yellow, 220 lb bgs lb.	...	.09½	...	.09½	.08	.08½
White, 220 lb bgs, lcl lb.	.09½	.11¾	.09½	.11¾	.08½	.09
Tapioca, 200 bgs, lcl ..lb.	...	.0715	...	.0715	...	.0715
White, 140 lb bgs ..100 lb.	...	3.95	...	3.95	3.75	3.95
Diamylamine, c-l, drs, wks lb.	...	.50	...	.50	.47	.50
lcl drs, wks ....lb.	...	.64	.53	.64	.48	.53
Diamylene, drs, wks ....lb.	...	.105	...	.105	.095	.105
lcl, drs ....lb.	...	.112	...	.112	...	...
tks, wks ....lb.	...	.09½	...	.09½	.08½	.09½
Diamylether ....lb.	...	...	...	...	.085	.102
lcl, drs ....lb.	...	.102	...	.102	...	...
c-l, drs ....lb.	...	.095	...	.095	...	...
tks ....lb.	...	.085	...	.085	...	...
Diamylnaphthalene, lcl, drs, f.o.b. wks ....lb.	...	.17	...	.17	.17	.20
Diamylphenol, lcl, drs ....lb.	...	.21	...	.21	...	...
Diamylphthalate, drs, wks lb.	.21	.21½	.21	.21½	.21	.21½
Diamyl Sulfide, drs, lcl ..lb.	...	.25	...	.25	...	...
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks ....lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	...	.64	.53	.64	...	.53
c-l, drs, wks ....lb.	...	.50	...	.50	...	.50
tks, wks ....lb.	...	.48	...	.48	...	.48
Dibutyl Ether, drs, wks, lcl lb.	.26	.28	.26	.28	.25	.28
Dibutylphthalate, drs, wks, frt all'd ....lb.	.21	.23	.21	.23	.19	.20
Dibutyltartrate, 50 gal drs lb.	...	.87	...	.87	.50	.87
Dichlorethylene, drs ....lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks ....lb.	.15	.16	.15	.16	.15	.16
tks, wks ....lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, c-l, drs lb.	...	.037	...	.037	.025	.04
lcl, drs ....lb.	...	.045	...	.045	...	...
tks, wks ....lb.	...	.03	...	.03	.0221	.025
Diethanolamine, tks, wks lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs, lcl, f.o.b., wks ....lb.	...	.81	.70	.81	...	.70

j A delivered price; * Depends upon point of delivery.
(*FP*) Full Priority.

* These prices were on a delivered basis.

	Current Market		1942		1941	
			Low	High	Low	High
Diethylamino Ethanol, lcl, drs, f.o.b. Wyandotte, frt all'd E. Miss ... lb.	...	.85	.75	.85	...	.75
Diethylaniline, 850 lb drs lb.	...	.40	...	.40	...	.40
Diethylcarbonate, com drs lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs . lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, c-l, drs .. lb.	...	.21½	...	.21½	.19	.20
Diethylsulfate, tech, drs, wks, lcl ... lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs ... lb.	.14	.15½	.14	.15½	.14	.15½
Mono ethyl ether, drs .. lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks ... lb.	...	.13½	...	.13½	...	.13½
Mono butyl ether, drs .. lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks ... lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks ... lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls ... lb.	...	.16	...	.16	...	.16
Oleate, bbls ... lb.	...	.17	...	.17	...	.17
Stearate, bbls ... lb.	...	.22	...	.22	...	.22
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ... lb.	.85	.90	.85	.90	.85	1.05
Dimethylaniline, 240 lb drs lb.	.23	.24	.23	.24	.23	.24
Dimethyl phthalate, drs, wks, frt all'd ... lb.	...	.20	...	.20	.18½	.20
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, 400 lb bbls ... lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls ... lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	...	.22	...	.22	...	.22
Dinitrotoluene, 300 lb bbls lb.	...	.18	...	.18	.15½	.18
Diphenyl, bbls ... lb.	...	.15	...	.15	.15	.20
Diphenylamine ... lb.	...	.25	...	.25	...	.25
Diphenylguanidine, 100 lb drs ... lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	55.00	60.00	55.00	60.00	32.00	52.00
Extract ... lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).						
E						
Egg Yolk, dom., 200 lb. cases lb.	1.00	1.05	1.00	1.05	.60	1.05
Epsom Salt, tech, 300 lb bbls c-l, NY ... 100 lb.	...	1.90	...	1.90	...	1.90
USP, c-l, bbls ... 100 lb.	...	2.10	...	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs ... lb.	.52	.53	.52	.53	.26	.53
Isopropyl 50 gal drs ... lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd ... lb.	...	.06	...	.06	...	.06
Nitrous conc bottles ... lb.	...	.73	...	.73	...	.73
Synthetic, wks, tks ... lb.	...	.08	...	.08	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd ... lb.	.11	.12	.11	.12	.06½	.12
drs, frt all'd ... lb.	.12	.13	.12	.13	.07½	.13
99%, tks, frt all'd ... lb.	...	.12¼	...	.12¼	.06¾	.12¼
drs, frt all'd ... lb.	...	.13¼	...	.13¼	.07¾	.13¼
Acetoacetate, 110 gal drs lb.	...	.37½	...	.37½	.27½	.37½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs ... lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd ... lb.	.50	.60	.50	.60	.45	.50
Chloride, 200 lb drs ... lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys .. lb.	...	.30	...	.30	...	.30
Crotonate, drs ... lb.	...	.35	...	.35	...	.35
Formate, drs, frt all'd . lb.	...	.27¾	...	.27¾	.25	.27¾
Lactate, drs, wks ... lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks ... lb.	...	.33	...	.33	.25	.33
Silicate, drs, wks ... lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs ... lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont ... lb.	.75	.85	.75	.85	.75	.85
Anhydrous ... lb.	...	.75	...	.75	...	.75
Dichloride, (*FP*) 50 gal drs, E. Rockies ... lb.	...	.0742	...	.0742	.0693	.0746
Glycol, 50 gal drs, wks. lb.	.14½	.18½	.14½	.18½	.14½	.18½
tks, wks ... lb.	...	.13½	...	.13½	...	.13½
Mono Butyl Ether, drs, wks ... lb.	.16½	.17½	.16½	.17½	.16½	.17½
tks, wks ... lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs wks ... lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks ... lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks ... lb.	.11½	.12½	.11½	.12½	.11½	.12½
tks, wks ... lb.	...	.10½	...	.10½	...	.10½
Mono Methyl Ether, drs wks ... lb.	.15½	.16½	.15½	.16½	.15½	.16½
tks, wks ... lb.	...	.14½	...	.14½	...	.14½
Oxide, cyl ... lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline ... lb.	.45	.47½	.45	.47½	.45	.47½
F						
Feldspar, blk pottery ... ton	...	19.00	...	19.00	17.00	19.00
Powd. blk wks ... ton	14.00	17.50	14.00	17.50	14.00	17.50
Ferric Chloride, tech, crys, **475 lb bbls ... lb.**	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys ... lb.	.06½	.07	.06½	.07	.06½	.07

l + 10; *m* + 50; * Bbls. are 20c higher.
FP Full Priority. *PC* Price Ceiling.

	Current	Market	1942 Low	1942 High	1941 Low	1941 High
Fish Scrap, dried, unground wks ....unit *l*	...	4.75	...	4.75	4.35	4.85
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ....unit *m*	...	2.75	...	2.75	2.75	3.25
Fluorspar, 98% bgs ....ton	32.00	34.00	32.00	34.00	29.00	34.00
Formaldehyde, c-l, bbls, wks (*FP, PC*) ....lb.	.055	.0575	.055	.0575	...	...
Fossil Flour ....lb.	.02½	.04	.02½	.04	.02½	.04¼
Fullers Earth, blk, mines ton	8.50	15.00	8.50	15.00	8.50	15.00
Imp powd, c-l, bgs ....ton	30.00	40.00	30.00	40.00	no prices	
Furfural (tech) drs, wks lb.	...	.15	...	.15	.10	.15
tks, wks ....lb.	...	.09	...	.09	...	.09
Furfuramide (tech) 100 lb drs ....lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.18	.18½	.18	.18½	.16	.19½
Fustic, crystals, 100 lb boxes ....lb.	.28	.32	.28	.32	.24	.32
Liquid 50°, 600 lb bbls lb.	.12½	.16	.12½	.16	.10½	.16
Solid, 50 lb boxes .....lb.	.19	.21	.19	.21	.19	.21
G						
G Salt paste, 360 lb bbls ..lb.	...	.45	...	.45	...	.45
Gambier, com 200 lb bgs lb.	...	.09½	...	.09½	.06½	.09½
Singapore cubes, 150 lb bgs . 100 lb.	.12½	.13	.12½	.13	.08¼	.11
Glauber's Salt, tech, c-l, bgs, wks* 100 lb.	1.05	1.28	1.05	1.28	.95	1.28
Anhydrous, see Sodium Sulfate						
Glue, bone, com grades, c-l bgs ....lb.	.15½	.18½	.15½	.18½	.13½	.18½
Better grades, c-l, bgs lb.	.19	.30	.19	.30	.15	.30
Glycerin (*PC*) CP, drs ...lb.	...	.18¼	...	.18¼	.14½	.19½
Dynamite, 100 lb drs ...lb.	...	.18¼	...	.18¼	...	.18¼
Saponification, drs .....lb.	...	.12¾	...	.12¾	.09½	.20½
Soap Lye, drs ....lb.	...	.11½	...	.11½	.07⅛	.18
Glyceryl Bori-Borate, bbls lb.	...	.40	...	.40	...	.40
Monoricinoleate, bbls ...lb.	...	.27	...	.27	...	.27
Monostearate, bbls .....lb.	...	.30	...	.30	...	.30
Oleate, bbls ....lb.	...	.22	...	.22	...	.22
Phthalate ....lb.	...	.38	...	.38	...	.38
Glyceryl Stearate, bbls ...lb.	...	.18	...	.18	...	.18
Glycol Bori-Borate, bbls ..lb.	...	.22	...	.22	...	.22
Phthalate, drs ....lb.	...	.38	...	.38	...	.38
Stearate, drs ....lb.	...	.26	...	.26	...	.26
GUMS						
Gum Aloes, Barbadoes ...lb.	.80	.85	.80	.85	.80	.95
Arabic, amber sorts ....lb.	.22	.24	.22	.24	.14	.25
White sorts, No. 1, bgs lb.	.33	.35	.33	.35	.35	.45
Powd, bbls ....lb.	.26	.28	.26	.28	.18	.30
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY ....lb.	.04½	.05½	.04½	.05½	.04½	.05½
California, f.o.b. NY, drs ton	20.00	36.50	20.00	36.50	20.00	36.50
Egyptian, 200 lb cases, f.o.b. NY ....lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases ....lb.	.45	.50	.45	.50	.19	.50
Copal, Congo, 112 lb bgs, clean, opaque ....lb.	...	.49½	...	.49½	...	.49½
Dark amber ....lb.	...	.12¾	...	.12¾	...	.12¾
Light amber ....lb.	...	.17	...	.17	...	.17
Copal, East India, 180 lb bgs						
Macassar pale bold ... lb.	...	.17⅜	...	.17⅜	.12¾	.17⅜
Chips ....lb.	...	.11½	...	.11½	.06¾	.11½
Dust ....lb.	...	.07	...	.07	.05¼	.07
Nubs ....lb.	...	.13⅜	...	.13⅜	.10½	.13⅜
Singapore, Bold ....lb.	...	.22⅜	...	.22⅜	.15¾	.22⅜
Chips ....lb.	...	.12⅜	...	.12⅜	.08½	.12⅜
Dust ....lb.	...	.07	...	.07	.05¼	.07
Nubs ....lb.	...	.17¾	...	.17¾	.11	.17¾
Copal Manila, 180-190 lb	...	.14	...	.14	.13⅞	.14
Loba B ....lb.	...	.14¼	...	.14¼	.11¾	.14¼
Loba C ....lb.	...	.13⅞	...	.13⅞	.11¼	.13⅞
DBB ....lb.	...	.12¼	...	.12¼	.10	.12¼
MA sorts ....lb.	...	.10¼	...	.10¼	.07¾	.10¼
Copal Pontianak, 224 lb cases, bold genuine ..lb.	...	.22⅞	...	.22⅞	.15⅜	.22⅞
Chips ....lb.	...	.14½	...	.14½	.10	.14½
Mixed ....lb.	...	.17⅞	...	.17⅞	.14⅜	.17⅞
Nubs ....lb.	...	.18⅞	...	.18⅞	.12¾	.18⅞
Split ....lb.	...	.19⅝	...	.19⅝	.13¾	.19⅝
Damar Batavia, 136 lb cases						
A ....lb.	...	.35¾	...	.35¾	.21⅝	.35¾
B ....lb.	...	.34⅜	...	.34⅜	.20¼	.34⅜
C ....lb.	...	.28⅝	...	.28⅝	.14⅝	.28⅝
D ....lb.	...	.25⅝	...	.25⅝	.13¼	.25⅝
A/D ....lb.	...	.28⅜	...	.28⅜	.15¼	.28⅜
A/E ....lb.	...	.25⅝	...	.25⅝	.12⅞	.25⅝
E ....lb.	...	.18¾	...	.18¾	.10	.18¾
F ....lb.	...	.13¾	...	.13¾	.08	.13¾
Singapore, No. 1 ......lb.	...	.30⅝	...	.30⅝	.16⅝	.30⅝
No. 2 ....lb.	...	.25⅜	...	.25⅜	.12¼	.25⅜
No. 3 ....lb.	...	.12⅜	...	.12⅜	.07⅛	.12⅜
Chips ....lb.	...	.23½	...	.23½	.11	.23½
Dust ....lb.	...	.13	...	.13	.07⅛	.13
Seeds ....lb.	...	.17¾	...	.17¾	.09⅞	.17¾
Elemi, cns, c-l ....lb.	...	.08⅞	...	.08⅞	.08½	.08⅞
Ester ....lb.	.08½	.09½	.08½	.09½	.06¼	.09½
Gamboge, pipe, cases ....lb.	.95	1.00	.95	1.00	.95	1.00
Powd, bbls ....lb.	1.05	1.10	1.05	1.10	1.05	1.10
Ghatti, sol, bgs ....lb.	.11	.15	.11	.15	.11	.15
Karaya, bbls, bxs, drs ...lb.	.14	.33	.14	.33	.14	.33

FP Full Priority. *PC* Price Ceiling.

Prices

		Current Market		1942		1941	
				Low	High	Low	High
Kauri, NY							
Brown XXX, **cases**	lb.	...	.60	...	.60	...	.60
BX	lb.	...	.38	...	.38	...	.38
B1	lb.	...	.28	...	.28	...	.28
B2	lb.	...	.24	...	.24	...	.24
B3	lb.	...	.18½	...	.18½	...	.18½
Pale XXX	lb.	...	.61	...	.61	...	.61
No. 1	lb.	...	.41	...	.41	...	.41
No. 2	lb.	...	.24	...	.24	...	.24
No 3	lb.	...	.17¾	...	.17¾	...	.17¾
Kino, tins	lb.	no stocks		no stocks		no prices	
Mastic	lb.	3.25	3.30	3.25	3.30	1.50	3.30
Sandarac, prime quality, 200 lb bgs & 300 lb cks	lb.	1.00	1.10	1.00	1.10	.50	1.10
Senegal, picked bgs	lb.	...	.30	...	.30	...	.30
Sorts	lb.	...	.13	...	.13	...	.13
Thus, bbls	280 lbs.	...	16.50	...	16.50	15.00	16.50
Tragacanth, No. 1, cases	lb.	3.50	3.60	3.50	3.60	2.75	3.40
No. 2	lb.	2.00	3.00	2.00	3.00	2.45	2.80
No. 3	lb.	1.10	1.20	1.10	1.20	1.10	2.60
Yacca, bgs	lb.	.06½	.07¾	.06½	.07¾	.03½	.07¾
H							
Hematine crys, 400 lb bbls	lb.	.24	.34	.24	.34	.20	.34
Hemlock, 25%, 600 lb bbls							
wks	lb.	nom.	.03½	nom.	.03½	.03⅛	.03½
tks	lb.	nom.	.03	nom.	.03	.02¾	.03
Hexalene, 50 gal drs, wks	lb.	...	.23	...	.23	.23	.30
Hexane, normal 60-70° C. Group 3, tks	gal.	...	.11	...	.11	.09¾	.11
Hexamethylenetetramine, powd, drs (*FP*)	lb.	.32	.33	.32	.33	.32	.33
Hexyl Acetate, secondary, delv, drs	lb.	.13	.13½	.13	.13½	.13	.13½
tks	lb.	...	.12	...	.12	...	.12
Hoof Meal, f.o.b. Chicago	unit	3.00	3.05	3.00	3.05	2.65	3.05
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	.16	.18½	.16	.18½	.16	.18½
Hydroxylamine Hydrochloride	lb.	...	3.15	...	3.15	...	3.15
Hypernic, Bags, No. 1	lb.	...	.42	...	.42	.40	.42
I							
Indigo, Bengal, bbls	lb.	2.14	2.20	2.14	2.20	1.63	2.20
Synthetic, liquid	lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars	lb.	...	2.00	...	2.00	...	2.00
Irish Moss, ord, bales	lb.	.30	.31	.30	.31	.25	.31
Bleached, prime, bales	lb.	.80	.85	.80	.85	.32	.46
Iron Acetate Liq. 17°, bbls delv	lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride							
Nitrate, coml, bbls	100 lb.	3.50	4.00	3.50	4.00	3.50	4.00
Isobutyl Carbinol (128-132°C)							
drs, frt all'd	lb.	...	.23½	...	.23½	.22½	.23½
tks, frt all'd	lb.	..	.21½	...	.21½	...	.21½
Isopropyl Acetate, tks, frt all'd	lb.	...	.076	...	.076	.06½	.07½
drs, frt all'd, c-l	lb.	...	.086	...	.086	.07½	.08½
Ether, see Ether, isopropyl							
K							
Keiselguhr, dom bags, c-l, Pacific Coast	ton	22.00	25.00	22.00	25.00	22.00	25.00
L							
Lead Acetate, f.o.b. NY, bbls,							
White, broken	lb.	.12	.12½	.12	.12½	.11	.12½
cryst, bbls	lb.	.12	.12½	.12	.12½	.11	.12½
gran, bbls	lb.	.12¾	.13¼	.12¾	.13¼	.11¾	.13¼
powd, bbls	lb.	.12¾	.13¼	.12¾	.13¼	.11¾	.13¼
Arsenate, East, drs	lb.	.11	.12	.11	.12	.09	.11
Linoleate, solid, bbls	lb.	...	.19	...	.19	...	.19
Metal, c-l, NY (*FP*)	100 lb.	5.85	5.90	5.85	5.90	5.70	5.90
Nitrate, 500 lb bbls, wks	lb.	.11	.14	.11	.14	.11	.14
Oleate, bbls	lb.	.18½	.20	.18½	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv	lb.	...	.09	...	.09	.08	.08¾
97% Pb_3O_4, delv	lb.	...	.09¼	...	.09¼	.084	.086
98% Pb_3O_4, delv	lb.	...	.09½	...	.09½	.0865	.0885
Resinate, fused, bbls	lb.	...	.09½	...	.09½	.09½	.16½
Stearate, bbls	lb.	...	.25	...	.25	...	.25
Titanate, bbls, c-l, f.o.b. wks, frt all'd	lb.	...	.10¼	...	.10¼	...	.10¼
White, 500 lb bbls, wks,	lb.	...	.07½	...	.07½	...	.07½
Basic sulfate, 500 lb bbls, wks	lb.	...	.06314	...	.06314	.06½	.07
Lime, chemical quicklime, f.o.b. wks, bulk	ton	7.00	13.00	7.00	13.00	7.00	13.00
Hydrated, f.o.b. wks	ton	8.50	16.00	8.50	16.00	8.50	16.00
Lime Salts, see Calcium Salts							
Lime, sulfur, dealers, tks	gal.	.07½	.08½	.07½	.08½	...	.07½
drs	gal.	.10	.14	.10	.14	.10	.14
Linseed Meal, bgs	ton	...	34.00	...	34.00	23.00	33.00
Litharge, coml, delv, bbls	lb.	...	.0790	...	.0790	.07	.0760
Lithopone, dom, ordinary, delv, bgs	lb.	...	.04¼	...	.04¼	.0385	.04¼
bbls	lb.	...	.04½	...	.04½	.041	.04½
Titanated, bgs	lb.	...	.056	...	.056	.05¼	.056
bbls	lb.	...	.0585	...	.0585	.05½	.0585
Logwood, 51°, 600 lb bbls	lb.	...	.13	...	.13	.10½	.13
Solid, 50 lb boxes	lb.	...	.22	...	.22	.16½	.22

(*FP*) Full Priority.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
M						
Madder, Dutch ....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbls ton	74.00	80.00	74.00	80.00	65.00	80.00
Magnesium Carb, tech, 70 lb bgs, wks ....lb.	...	.06¼	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks ....ton	...	32.00	...	32.00	...	32.00
Metal Ingots, c-l ....lb.	...	.27	...	.27	...	...
Oxide, calc tech, heavy bbls, frt all'd ....lb.	...	.26	...	.26	...	.26
Light bbls above basis lb.	...	.26	...	.26	...	.26
USP Heavy, bbls, above basis ....lb.	...	.26	...	.26	...	.26
Palmitate, bbls ....lb.	.33	.35	.33	.35	.33	.35
Silicofluoride, bbls ....lb.	.20	.25	.20	.25	.11	.25
Stearate, bbls ....lb.	.31	.33	.31	.33	.23	.31
Manganese, acetate, drs ..lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls lb.	.15	.16	.15	.16	.15	.16
Chloride, bbls ....lb.	.14	nom.	.14	nom.	...	.14
Dioxide, tech (peroxide), paper bgs, c-l ....ton	...	70.00	...	70.00	...	71.50
Hydrate, bbls ....lb.	...	.82	...	.82	...	.82
Linoleate, liq. drs ......lb.	.18	.19½	.18	.19½	.18	.19½
solid, precip, bbls ....lb.	...	.19	...	.19	...	.19
Resinate, fused bbls ...lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs ....lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs ....lb.	.10½	.11½	.10½	.11½	.10½	.11½
Mangrove, 55%, 400 lb bbls lb.						
Bark, African ....ton	no prices		no prices		34.00	38.00
Mannitol, pure cryst, cs, wks lb.	...	.85	...	.85	.85	.90
commercial grd, 250 lb bbls ....lb.	...	.40	...	.40	.35	.45
Marble Flour, blk ......ton	12.50	14.50	12.50	14.50	12.00	14.50
Mercury chloride (Calomel) lb.	...	2.95	...	2.95	2.70	2.95
Mercury metal ..76 lb. flasks	203.00	210.00	203.00	210.00	167.00	215.00
Mesityl Oxide, f.o.b. dest, tks ....lb.	...	.10½	...	.10½	.10½	.15
drs, c-l ....lb.	...	.11½	...	.11½	.11½	.16
drs, lcl ....lb.	...	.12	...	.12	.12	.16½
Meta-nitro-aniline ....lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ....lb.	1.05	1.10	1.05	1.10	1.05	1.10
Meta-phenylene diamine 300 lb bbls ....lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls ....lb.	...	.70	...	.70	.65	.70
Methanol, denat, grd, drs, c-l frt all'd (*FP*) (*PC*) gal.	...	.66	...	.66	.60	.66
tks, frt all'd ....gal.	...	.60	...	.60	...	.60
Pure, nat, drs, c-l, frt all'd ....gal. *a*	.55½	.61½	.55½	.61½	.35½	.55½
tks, nat ....gal. *a*	.50	.54½	.50	.54½	.30	.50
Synth, pure, drs ....gal. *b*	.34½	.40½	.34½	.40½	...	...
tks, synth ....gal. *b*	.28	.32½	.28	.32½	...	...
Methyl Acetate, tech tks, delv ....lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv ......lb.	.11	.12½	.11	.12½	.07	.12½
C.P. 97-99%, tks, delv lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv ......lb.	.10½	.13	.10½	.13	.10½	.13
Acetone, frt all'd, drs gal. *p*	...	.81	...	.81	.37½	.81
tks, frt all'd ......gal. *p*	...	.75	...	.75	.32	.75
Synthetic, frt, all'd, drs ....gal. *p*	.51	.54½	.51	.54½	.37½	.51
tks, frt all'd ...gal.	.43	.45½	.43	.45½	.32	.43
Anthraquinone ....lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks ......lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb. lots, frt all'd ....lb.	.50	.55	.50	.55	...	.55
less than 100 lbs. f.o.b. wks ....lb.	...	.60	...	.60	...	.60
Chloride, 90 lb. cyl ....lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.08	...	.08	.06	.08
50 gal drs, frt all'd, c-l lb.	...	.09½	...	.09½	.07	.09½
Formate, drs, frt all'd ..lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd ...lb.	...	.70	...	.70	.70	.80
Mica, dry grd, bgs, wks ..ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs ....lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes mixed, ref., l-c-l, drs, f.o.b. wks ....lb.	...	.16	...	.16	.16	.19
crude ....lb.	...	.14	...	.14	.14	.15
Monoamylamine, c-l, drs, wks lb.	...	.50	...	.50	.50	.52
lcl, drs, wks ....lb.	...	.64	...	.64	...	.55
Monoamylnaphthalene, l-c-l, drs, f.o.b. wks ....lb.	...	.17	...	.17	.17	.20
Monobutylamine, drs	...	.37	...	.37	...	.37
c-l, wks ....lb.	...	.40	...	.40	...	.40
l-c-l, wks ....lb.	...	.64	...	.64	...	.48
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks, lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks ......lb.	...	.46	...	.46	.35	.65
Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs ....lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, wks ....lb.	...	.67	...	.67	...	.67

a Producers of natural methanol divided into two groups and prices vary for these two divisions; *b* Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones.

(*FP*) Full Priority. (*PC*) Price Control.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Myrobalans 25%, liq bbls lb.	no prices		no prices		no prices	
50% Solid, 50 lb boxes lb.	no prices		no prices		no prices	
J1 bgs ....ton	no prices		no prices		35.00	48.00
J2 bgs ....ton	no prices		no prices		28.00	39.00
N						
Naphtha, v.m.&p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks ....gal.	...	:27	...	.27	...	.26
drs, c-l ....gal.	...	.31	...	.31	...	.31
Naphthalene, dom, crude bgs. wks ....lb.	2.50	2.75	2.50	2.75	2.25	2.75
Balls, flakes, pks ....lb.	...	.08	...	.08	.06¼	.08
Balls, ref'd bbls, wks ..lb.	...	.08	...	.08	.07	.08
Flakes, re'd, bbls, wks ..lb.	...	.08	...	.08	.07	.08
Nickel Carbonate, bbls ...lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls ....lb.	.18	.20	.18	.20	.18	.20
Metal ingot ....lb.	.35	.36	.35	.36	.34	.36
Oxide, 100 lb kgs, NY .lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY ..lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs, 55 lb drs ....lb.	...	.703	...	.703	...	.703
Nitre Cake, blk ....ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks ....lb.	.08	.09	.08	.09	.08	.09
tks ....lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		no prices	
dom, Eastern wks ...unit	2.75	3.00	2.75	3.00	2.20	3.00
dom, Western wks ...unit	...	2.60	...	2.60	1.75	2.60
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs ....lb.	no prices		no prices		.26	.29
O						
Oak Bark Extract, 25%, bbls lb.	.03½	.03¾	.03½	.03¾	.03⅛	.03¾
tks ....lb.	...	.02	...	.02	.02¾	.03
Octyl Acetate, tks, wks ..lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks NY .... lb.	...	.12	...	.12	.11	.11½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs, f.o.b. wks ....lb.	...	.25	...	.25	.15	.25
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs ...lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks lb.	.17	.17½	.17	.17½	.16	.17½
Orthodichlorobenzene, 1000 lb drs .... lb.	.06	.07½	.06	.07½	.06	.07½
Orthonitrochlorobenzene, 1200 lb drs, wks ....lb.	.15	.18	.15	.18	.15	.18
Orthonitroparachlorphenol, tins ....lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs ....lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks ....lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl ....lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls lb.	...	.23	...	.23	.21	.23
51° liquid ....lb.	...	.10	...	.10	...	.10
P						
Paraffin, rfd, 200 lb bgs (*PC*)						
122-127° M P ....lb.	...	.052	...	.052	.04¼	.057
128-132° M P ....lb.	.056	.0585	.056	.0585	.057	.0595
133-137° M P ....lb.	.0615	.0640	.0615	.0640	.06¼	.06½
Para aldehyde, 99%, tech, 55-110 gal drs, wks ..lb.	...	.12	...	.12	.10	.12
Aminoacetanilid, 100 lb kgs ....lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs ......lb.	...	.32	...	.32	...	.32
Dichlorobenzine 200 lb drs, wks ....lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks (*FP*) ....lb.	.23	.24	.23	.24	.23	.24
Nitroacetanilid, 300 lb bbls ....lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks ....lb.	...	.45	...	.45	...	.45
Nitrochlorobenzene, 1200 lb drs, wks ....lb.	...	.15	...	.15	...	.15
Nitro-orthotoluidine, 300 lb bbls ....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	...	.35	...	.35
Nitrosodimethylaniline, 120 lb bbls ....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	...	.30
Pentaerythritol, tech, bbls, delv ....lb.	.33½	.35½	.33½	.35½	...	...
Phenylenediamine, 350 lb bbls ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb. bbls ....lb.	...	.70	...	.70	...	.70
tks, wks ....lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks ....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks ....lb.	...	.48	...	.48	...	.48

(*FP*) Full Priority. (*PC*) Price Control

Current

Paris Green
Potassium Perchlorate

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Paris Green, dealers, drs lb.	.24	.26	.24	.26	.23	.25
Pentane, normal, 28-38° C,						
group, 3 tks ....gal.	...	.08½	...	.08½	...	.08½
drs, group 3 ....gal.	.11½	.16	.11½	.16	.11½	.16
Perchlorethylene, 10 lb drs,						
frt all'd (*FP*) ......lb.	.08	.08½	.08	.08½	.08	.08½
Petrolatum, dark amber,						
bbls ....lb.	...	.03¾	...	.03¾	.02¾	.03½
White, lily, bbls ......lb.	...	.05¾	...	.05¾	.04¾	.05¾
White, snow, bbls .....lb.	...	.06½	...	.06½	.05½	.06½
Petroleum Ether, 30-60°,						
group 3, tks ....gal.	...	.16	...	.16	.13½	.16
drs, group 3 ....gal.	...	.18	...	.18	.14½	.18
PETROLEUM SOLVENTS AND DILUENTS						
Cleaners naphthas, group						
3, tks, wks ....gal.	...	.07⅛	...	.07⅛	.07	.07⅛
East Coast, tks, wks gal.	...	.10½	...	.10½	.10	.10½
Lacquer diluents, tks						
East Coast ....gal.	...	.11	...	.11	.09½	.11
Group 3, tks ....gal.	.07⅜	.08⅛	.07⅜	.08⅛	.06¼	.08⅛
Naphtha, V.M.P., East						
tks, wks ....gal.	...	.10½	...	.10½	.09	.11
Group 3, tks, wks ...gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Petroleum thinner, 43-47,						
East, tks, wks ......gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks ...gal.	.06	.07	.06	.07	.05⅞	.07
Rubber Solvents, stand						
grd, East, tks, wks ..gal.	...	.10½	...	.10½	.09½	.10½
Group 3, tks, wks ...gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Stoddard Solvents, East,						
tks, wks ....gal.	...	.09½	...	.09½	.083	.09½
Group 3, wks ......gal.	...	.06⅝	...	.06⅝	.05½	.06⅝
Phenol, 250-100 lb drs ....lb.	.12½	.13	.12½	.13	.12	.13¾
tks, wks (*FP*) ....lb.	.11½	.12	.11½	.12	.11	.12
Phenyl-Alpha-Naphthylamine,						
100 lb kgs ....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs .....lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydro-						
chloride, com ....lb.	...	1.75	...	1.75	...	1.50
Phloroglucinol, tech, tins ..lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons ....lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines						
70% basis ....ton	...	2.40	...	2.40	2.15	2.40
72% basis ....ton	...	3.00	...	3.00	2.50	3.00
Florida Pebble, 68% basis ton	...	2.00	...	2.00	1.90	2.00
75-74% basis ....ton	...	4.00	...	4.00	...	2.90
Tennessee, 72% basis ..ton	...	5.00	...	5.00	4.50	5.00
Phosphorus Oxychloride 175						
lb. cyl (*FP*) ....lb.	.15	.18	.15	.18	.15	.18
Red, 110 lb cases ......lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs .lb.	.38	.42	.38	.42	.38	.42
Trichloride, cyl ....lb.	.15	.16	.15	.16	.15	.16
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, 100 lb						
drs, wks ....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist ....lb.	...	.74	...	.74	.50	.65
Steam dist wat wh bbls gal.	...	1.10	...	1.10	.59	.68
Pitch Hardwood, wks ...ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks ...ton	19.00	22.00	19.00	22.00	19.00	22.00
Burgundy, dom, bbls, wks lb.	.06	.06½	.06	.06½	.06	.06½
Imported ....lb.	no prices		no prices		no prices	
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls ....bbl.	6.75	7.00	6.75	7.00	6.00	7.00
Polyamylnaphthalene, 1-c-1,						
drs, f.o.b. wks ....lb.	...	.25	...	.25	.25	.30
Potash, Caustic, wks, sol ..lb	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake ....lb.	...	.07	...	.07	...	.07
liquid, tks ....lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, Dom						
30% basis, blk .....unit	...	.60	...	.60	...	.60
POTASSIUM						
Potassium Abietate, bbls ..lb.	...	.08	...	.08	...	.08
Acetate, tech, bbls, delv lb.	...	.28	...	.28	.26	.28
Bicarbonate, USP, 320 lb						
bbls ....lb.	...	.14	...	.14	.14	.17
Bichromate Crystals, 725						
lb csks *(*FP*) ....lb.	...	.09⅝	...	.09⅝	.08⅞	.09⅝
Binoxalate, 30 lb bbls ..lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800						
lb cks ....lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
liquid, tks ....lb.	...	.0275	...	.0275	...	.0275
drs, wks ....lb.	.03	.03⅛	.03	.03⅛	.03	.03⅛
Chlorate crys, 112 lb kgs,						
wks (*FP*) ....lb.	nom.	.11	nom.	.11	...	.11
gran, kgs ....lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs ....lb.	.09¾	.10	.09¾	.10	.09½	.10
Chloride, crys, bbls ....lb.	.08	nom.	.08	nom.	.04	.08
Chromate, kgs (*FP*) ...lb.	.24	.27	.24	.27	.24	.27
Cyanide, drs ....lb.	...	.55	...	.55	...	.55
Iodide, 250 lb bbls .....lb.	1.44	1.38	1.44	1.38	1.35	1.38
Metabisulfite, 300 lb bbls lb.	.18	.20	.18	.20	.18	.21
Muriate, bgs, dom, blk unit	.56	.58	.56	.58	.53½	.58
Oxalate, bbls ....lb.	.28	.30	.28	.30	.25	.30
Perchlorate, kgs,						
wks (*FP*) ....lb.	.09½	.11	.09½	.11	.09½	.11

* Spot price is ⅛c higher.
(*FP*) Full Priority.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Potassium (continued):						
Permanganate, USP, crys, 500 & 1000 lb drs, wks (*FP*) ....lb.	.19¾	.21	.19¾	.21	.19¼	.21
Prussiate, red, bbls ....lb.	no prices		no prices		no prices	
Yellow, bbls ....lb.	.17	.19	.17	.19	.16	.19
Sulfate, 90% basis, bgs ton	...	36.25	...	36.25	...	36.25
Titanium Oxalate, 200 lb bbls ....lb.	...	.45	...	.45	...	.40
Pot & Mag Sulfate, 48% basis bgs ....ton	...	26.00	...	26.00	26.00	27.00
Propane, group 3, tks ....lb.	.03	...	.03	...	.03¾	.04
Putty, com'l, tubs ....100 lb.	...	3.15	...	3.15	...	3.15
Linseed Oil, kgs ....100 lb.	...	5.00	...	5.00	...	5.00
Pyrethrum, conc liq:						
2.4% pyrethrins, drs, frt all'd ....gal.	...	4.30	...	4.30	4.40	4.95
3.6% pyrethrins, drs, frt all'd ....gal.	...	6.35	...	6.35	6.60	7.20
Flowers, coarse, bgs ...lb. bgs ....lb.	.21	.22	.21	.22	.20	.25
Fine powd, bbls ....lb.	.22	.23	.22	.23	.21	.26
Pyridine, denat, 50 gal drs gal.	...	1.71	...	1.71	...	1.71
Refined, drs ....lb.	...	.46	...	.46	...	.48
Pyrites, Spanish cif Atlantic ports, blk ....unit	no prices		no prices		no prices	
Pyrocatechin, CP, drs, tins lb.	2.15	2.40	2.15	2.40	2.15	2.40
Q						
Quebracho, 35% liq tks ..lb.	...	.05¼	...	.05¼	.03¾	.05½
450 lb bbls, c-l ....lb.	...	.05	...	.05	.04¼	.05
Solid, 63%, 100 lb bales cif ....lb.	...	.04⅞	...	.04⅞	...	.04⅞
Clarified, 64% bales ..lb.	...	.05	...	.05	.05	.05⅛
Quercitron, 41 deg liq, 450 lb. bbls ....lb.	...	.10	...	.10	.08½	.09½
Solid, drs ....lb.	...	.18	...	.18	.11	.16½
R						
R Salt, 250 lb bbls, wks ..lb.	...	.55	...	.55	...	.55
Resorcinol, tech cans ....lb.	.68	.74	.68	.74	.68	.74
Rochelle Salt, cryst ....lb.	...	.43½	...	.43½	.32½	.43½
Powd, bbls ....lb.	...	.42½	...	.42½	.31½	.42½
Rosin Oil, bbls, first run gal.	...	.48	...	.48	.40	.50
Second run ....gal.	...	.50	...	.50	.42	.56
Third run, drs ....gal.	...	.54	...	.54	.46	.57
Rosins 600 lb bbls, 100 lb unit ex, yard NY:**						
B	...	3.65	...	3.65	2.06	3.55
D	...	3.65	...	3.65	2.08	3.55
E	...	3.72	...	3.72	2.07	3.62
F	...	3.79	...	3.79	2.08	3.59
G	...	3.79	...	3.79	2.18	3.52
H	...	3.79	...	3.79	2.27	3.50
I	...	3.79	...	3.79	2.26	3.50
K	...	3.88	...	3.88	2.36	3.61
M	...	3.94	...	3.94	2.38	3.68
N	...	4.02	...	4.02	2.47	3.71
WG	...	4.75	...	4.75	2.79	4.52
WW	...	4.85	...	4.85	3.05	4.57
X	...	4.85	...	4.85	3.10	4.57
Rosins, Gum, Savannah (280 lb. unit):**						
B	...	3,10	...	3.10	1.31	3.00
D	...	3.21	...	3.21	1.51	3.00
E	...	3.27	...	3.27	1.60	3.07
F	...	3.24	...	3.24	1.62	3.04
G	...	3.24	...	3.24	1.60	2.97
H	...	3.24	...	3.24	1.63	2.97
I	...	3.24	...	3.24	...	2.98
K	...	3.30	...	3.30	1.84	3.06
M	...	3.39	...	3.39	2.01	3.13
N	...	3.47	...	3.47	2.65	3.16
WG	...	4.18	...	4.18	2.76	3.97
WW	...	4.30	...	4.30	2.96	4.02
X	...	4.30	...	4.30	2.96	4.02
Rosin, Wood, c-l, FF grade, NY	1.70	2.00	1.70	2.00	1.40	2.00
Rotten Stone, bgs mines ton	25.50	37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls ..lb.	no prices		no prices		no prices	
Powdered, bbls ....lb.	no prices		no prices		no prices	
S						
Sago Flour, 150 lb bgs ..lb.	.04¾	.05½	.04¾	.05½	.03½	.05½
Sal Soda, bbls wks ...100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks ....ton	...	15.00	...	15.00	13.00	17.00
Chrome, c-l, wks ....ton	...	16.00	...	16.00	...	16.00
Saltpetre, gran, 450-500 lb bbls ....lb.	...	.082	...	.082	.076	.082
Cryst, bbls ....lb.	...	.092	...	.092	.086	.092
Powd, bbls ....lb.	...	.092	...	.092	.086	.092
Satin, White, pulp, 550 lb bbls ....lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs ....lb.	...	.46	...	.46	...	.46

** Jan. 30. 1941, high and low based on 280 lb. unit.
r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.. refined 6c higher in each case; (*FP*) Full Priority.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Shellac, Bone dry, bbls ..lb. *s*	.39	.40	.39	.40	.26	.40
Garnet, bgs ....lb.	.37	.39	.37	.39	.20	.39
Superfine, bgs ....lb. *s*	.33	.34	.33	.34	.16½	.34
T. N., bgs ....lb. *s*	.32	.33	.32	.33	.16	.33
Silver Nitrate, vials ....oz.	...	.26⅞	...	.26⅞	.24	.26⅞
Slate Flour, bgs, wks ....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks ....100 lb.	...	1.15	...	1.15	...	1.15
58% light, bgs ....100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
blk ....100 lb.	...	.90	...	.90	...	.90
paper bgs ....100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
bbls ....100 lb.	...	1.35	...	1.35	1.35	1.45
Caustic, 76% grnd & flake, drs ....100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs ....100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks ..100 lb.	...	2.00	...	2.00	...	2.00
SODIUM						
Sodium Abietate, drs ....lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran. powd, flake, 450 lb bbls wks ....lb.	...	.05	...	.05	.04	.06
90%, bbls 275 lb delv lb.	.06½	.07	.06½	.07	.06	.07
anhyd, drs, delv ....lb.	.08½	.10	.08½	.10	.08¼	.10
Alginate, drs ....lb.	.69	.73	.69	.73	.39	.73
Antimoniate, bbls ....lb.	.15	.15½	.15	.15½	.14	.15½
Arsenate, drs ....lb.	...	.08	...	.08	.07	.08¾
Arsenite, liq, drs ....gal.	...	.35	...	.35	...	.35
Dry, gray, drs, wks ..lb.	...	.06¾	...	.06¾	.06½	.09¼
Benzoate, USP kgs ....lb.	.46	.50	.46	.50	.46	.50
Bicarb, powd, 400 lb bbl, wks ....100 lb.	...	1.70	...	1.70	...	1.70
Bichromate, 500 lb cks, wks* (*FP*) ....lb.	...	.07⅜	...	.07⅜	.06⅞	.07½
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.03	.031
35-40% sol bbls, wks 100 lb.	1.40	1.80	1.40	1.80	1.40	1.80
Chlorate, bgs, wks ....lb.	...	.06¼	...	.06¼	...	.06¼
Cyanide, 96-98%, 100 & 250 lb drs, wks ....lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv ....lb.	.09½	.10½	.09½	.10½	.09	.10
Fluoride, white 90%, 300 lb bbls, wks ....lb.	...	.08	...	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks ....lb.	.17	.18	.17	.18	.17	.18
Hyposulfite, tech, pea crys 375 lb bbls, wks ..100 lb.	...	2.75	...	2.75	...	2.80
Tech, reg cryst, 375 lb bbls, wks ....100 lb.	...	2.45	...	2.45	...	2.45
Iodide, Jars ....lb.	...	2.42	...	2.42	...	2.42
Metanilate, 150 lb bbls ..lb.	...	.40	...	.40	.41	nom.
Metasilicate, gran, c-l, wks ....100 lb.	...	2.50	...	2.50	2.35	2.50
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	...	3.05
Anhydrous, wks, c-l, drs ....100 lb.	...	4.00	...	4.00	3.75	4.00
wks, lcl, drs ....100 lb.	...	5.05	...	5.05	5.05	5.05
Monohydrated, bbls ....lb.	...	.026	...	.026	.023	.026
Naphthenate, drs ....lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	...	.50
Nitrate, 92% crude, 200 lb. bgs, c-l, NY ....ton	...	29.35	...	29.35	28.70	29.35
100 bgs, same basis ..ton	...	30.05	...	30.05	29.40	30.05
Bulk ....ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls ....lb.	...	.06¾	...	.06¾	.06¾	.11½
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l anhyd. ....lb.	...	.04¾	...	.04¾	.04½	.04¾
Perborate, drs, 400 lb ..lb.	...	.14¾	...	.14¾	.14¾	.15¼
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	2.75	2.90	2.75	2.90	2.30	2.90
bgs, wks ....100 lb.	2.55	2.70	2.55	2.70	2.10	2.70
Tri-sodium, tech, 325 lb. bbls, wks ....100 lb.	2.90	3.05	2.90	3.05	2.45	3.05
bgs, wks ....100 lb.	2.70	2.85	2.70	2.85	2.25	2.85
Picramate, 160 lb kgs ..lb.	...	.65	...	.65	...	.65
Prussiate, Yellow, 350 lb bbls, wks ....lb.	...	.11	...	.11	.10½	.11
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	.0545	.0638	.0545	.0638	.0510	.0610
Sesquisilicate, drs, c-l, wks ....100 lb.	...	3.05	...	3.05	...	3.05
Silicate, 60°, 55 gal drs, wks ....100 lb.	...	1.70	...	1.70	...	1.70
40°, 55 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks ....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY ....lb.	.12	.15	.12	.15	.09¾	.15
Stannate, 100 lb drs ....lb.	.33½	.36½	.33½	.36½	.32½	.37
Stearate, bbls ....lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks ....100 lb. *t*	1.70	1.90	1.70	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, c-l, wks ....lb.	...	.024	...	.024	.02¼	.03
Solid, 650 lb drs, c-l, wks ....lb.	...	.0315	...	.0315	.03	.03¾
Sulfite, powd, 400 lb bbls wks ....lb.	...	.05¼	...	.05¼	...	.05¼
Sulfocyanide, drs ....lb.	.55	.65	.55	.65	.28	.65
Sulforicinoleate, bbls ...lb.	...	.12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)						
Tungstate, tech, crys, kgs lb.	no prices		no prices		no prices	

s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. *t* Bags 15c lower; * Jan. 31. (*PC*) Price Control.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Sorbitol, drs, wks ....lb.	...	.17¾	...	.17¾	.14¾	.17¾
Spruce, Extract, ord, tks ..lb.	...	.01¼	...	.01¼	.01⅛	.01¼
Ordinary, bbls ... lb.	...	.01¾	...	.01¾	.01⅝	.01¾
Super spruce ext, tks ..lb.	...	.01½	...	.01½	.01⅜	.01½
Super spruce ext, bbls ..lb.	...	.02	...	.02	.01⅞	.02
Super spruce ext, powd, bgs ....lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs 100 lb.	...	3.10	...	3.10	2.90	3.10
Powd, 140 lb bgs ..100 ib.	...	3.20	...	3.20	3.05	3.80
Potato, 200 lb bgs .....lb.	...	.0610	...	.0610	.04½	.0585
Imp, bgs ....lb.	no prices		no prices		no prices	
Rice, 200 lb bbls ......lb.	.09	.10	.09	.10	.07½	.09½
Sweet Potato, 240 lb bbls, f.o.b. plant ......100 lb.	nom.	7.00	nom.	7.00	nom.	7.00
Wheat, thick, bgs .....lb.	...	.05	...	.05	...	.05
Strontium, carbonate, 600 lb bbls, wks ....lb.	no prices		no prices		no prices	
Nitrate, 600 lb bbls, NY lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
Sucrose, octa-acetate, den, grd, bbls, wks ....lb.	...	.45	...	.45	...	.45
tech, bbls, wks ....lb.	...	.40	...	.40	...	.40

SULFUR

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Sulfur, crude, f.o.b. mines ton	...	16.00	...	16.00	...	16.00
Flour, com'l, bgs ...100 lb.	1.65	1.95	1.65	1.95	1.40	1.95
bbls ....100 lb.	1.95	2.50	1.95	2.50	1.95	2.50
Rubbermakers, bgs .100 lb.	...	2.05	...	2.05	...	2.05
bbls ....100 lb.	...	2.35	...	2.35	...	2.35
Extra fine, bgs ....100 lb.	...	2.35	...	2.35	...	2.35
Superfine, bgs .....100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls ....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ....100 lb.	3.05	3.35	3.05	3.35	2.80	3.35
bbls ....100 lb.	3.40	3.70	3.40	3.70	3.15	3.70
Roll, bgs ....100 lb.	2.40	2.70	2.40	2.70	2.15	2.70
bbls ....100 lb.	2.30	2.85	2.30	2.85	2.30	2.85
Sulfur Chloride, 700 lb drs, wks ....lb.	.03	.08	.03	.08	.03	.08
Sulfur Dioxide, 150 lb cyl lb.	.07	.09	.07	.09	.07	.09
Multiple units, wks ....lb.	.04½	.07	.04½	.07	.04½	.07
tks, wks ....lb.	.04	.06	.04	.06	.04	.06
Refrigeration, cyl, wks .lb.	.16	.40	.16	.40	.16	.40
Multiple units, wks ....lb.	.07½	.10	.07½	.10	.07½	.10
Sulfuryl Chloride ....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd .....ton	no prices		no prices		no prices	
Extract, 42°, bbls ......lb.	.08	.06¼	.08	.06¼	.06	.08
Superphosphate, 16% bulk, wks ....ton	...	10.10	...	10.10	8.50	10.00
Run of pile ....ton	...	9.60	...	9.60	8.00	9.60
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit .....ton	...	.80	...	.80	.68	.80

T

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Talc, Crude, 100 lb bgs, NY ton	14.00	16.00	14.00	16.00	14.00	16.00
Ref'd 100 lb bgs, NY ton	17.25	19.25	17.25	19.25	17.25	19.25
French, 220 lb bgs, NY ton	no prices		no prices		no prices	
Ref'd, white bgs, NY ton	no prices		no prices		no prices	
Italian, 220 lb bgs to arr ton	no prices		no prices		no prices	
Ref'd, white bgs, NY ton	no prices		no prices		no prices	
Tankage, Grd, NY ....unit u	...	4.25	...	4.25	2.35	4.10
Ungrd ....unit u	...	5.25	...	5.25	2.35	5.10
Fert grade, f.o.b. Chgo unit u	...	5.60	...	5.60	2.35	5.60
South American cif unit u	...	5.05	...	5.05	2.60	4.75
Tapioca Flour, high grade, bgs ....lb.	.04½	.07	.04½	.07	.03	.06¾
Tar Acid Oil, 15%, drs .gal.	...	.27½	...	.27½	.22	.24
25% drs ....gal.	...	.31½	...	.31½	.25	.27½
Tar, pine, delv, drs ....gal.	...	.32½	...	.32½	.26	.29
tks, delv, E. cities ....gal.	...	.24	...	.24	...	.22
Tartar Emetic, tech, bbls .lb.	...	.47¾	...	.47¾	.36¾	.47¾
USP, bbls ....lb.	.52¾	.53	.52¾	.53	.42	.53
Terpineol, den grade, drs lb.	...	.17	...	.17	...	.17
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech lb.	.08	.09	.08	.09	.08	.09
Tetralene, 50 gal drs, wks lb.	...	.19	...	.19	.19	.21
Thiocarbanilid, 170 lb bbls lb.	...	.24	...	.24	...	.24
Tin, crystals 500 lb bbls, wks lb	.39	.39½	.39	.39½	.38	.40
Metal, NY (*PC*) ......lb.	*.52	.52	*.52	.52	.501	.52¾
Oxide, bbls, wks ....lb.	.55	.57	.55	.57	.54	.56
Tetrachloride, 100 lb drs, wks ....lb.	no prices		no prices		.25¼	.31
Titanium Dioxide, 300 lb bbls lb.	...	.14½	...	.14½	.13¾	.14½
Barium Pigment, bbls ..lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Calcium Pigment, bbls .lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
Titanium tetrachloride, drs, f.o.b. Niagara Falls ....lb.	.32	.45	.32	.45	.32	.45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls .....lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks ....lb.	...	.26	...	.26	...	.26
Toluol, drs, wks (*FP*) ..gal.	...	.33	...	.33	.32	.33
tks, frt all'd (*FP*) ....gal.	...	.28	...	.28	.27	.28
Toner Lithol, red, bbls ...lb.	.55	.60	.55	.60	.55	.60
Para, red, bbls ....lb.	.70	.75	.70	.75	.70	.75
Toluidine, bgs ....lb.	...	1.05	...	1.05	...	1.05
Triacetin, 50 gal drs, wks, lb.	...	.26	...	.26	...	.26
Triamyl Borate, lcl, drs, wks, lb.	...	.33	...	.33	.27	.33
Triamylamine, drs, lcl, wks, drs ....lb.	...	1.01	...	1.01	...	1.01
Tributylamine, lcl, drs, f.o.b. wks ....lb.	...	.81	...	.81	...	.81
Tributyl citrate, drs, frt all'd lb.	...	.24	...	.24	.24	.26

(*FP*) Full Priority.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Tributyl Phosphate, frt all'd lb.	...	.47	...	.47	.42	.47
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	...	.08	...	.08	.08	.09
Tricresyl phosphate, tech, (*FP*) ....lb.	...	.25	...	.25	.22	.36½
Triethanolamine, 50 gal drs, wks ....lb.	...	.19	...	.19	...	.19
tks, wks ....lb.	...	.18	...	.18	...	.18
Triethylamine, lcl, drs, f.o.b. wks ....lb.	...	1.16	...	1.16	...	1.16
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls ....lb.	...	.30	...	.30	...	.30
Stearate bbls ....lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest. ....lb.	...	.54	...	.54	.50	.54
Trimethylamine, c-l, drs, frt all'd E. Mississippi ....lb.	...	.85	...	.85	.85	1.00
Triphenylguanidine ....lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs (*FP*) ....lb.	...	.88	...	.88	.38	.88
Tripoli, airfloated, bgs, wks ton	21.00	26.00	21.00	26.00	21.00	26.00
Turpentine (Spirits), c-l, NY dock, bbls ....gal.	...	.82½	...	.82½	.45	.83
Savannah, bbls ....gal.	...	.70½	...	.70½	.33½	.72½
Wood Steam dist, drs, c-lcl, NY ....gal.	.77	.80	.77	.80	.35	.76
tks, delv E. cities ..gal.	...	.72	...	.72	...	...
Wood, dest dist, cl-lcl, drs, delv E. cities ....gal.	.65	.70	.65	.70	.35	.65
tks, delv E. cities ..gal.	...	.58	...	.58	...	...
U						
Urea, pure 112 lb cases ..lb.	...	.12	...	.12	...	.12
Fert grade, bgs, c. i. f. S.A. points ....ton	no prices		no prices		no prices	
Dom f.o.b., wks ....ton	...	80.00	...	80.00	...	85.00
Urea Ammonia, liq., nitrogen basis ....ton	...	121.58	...	121.58	...	121.58
V						
Valonia beard, 42%, tannin bgs ....ton	no prices		no prices		no prices	
Cups, 32% tannin bgs ..ton	no prices		no prices		no prices	
Extract, powd, 63% ...lb.	no prices		no prices		no prices	
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots ....lb.	...	2.60	...	2.60	...	2.60
Ex-guaiacol ....lb.	...	2.35	...	2.35	2.50	2.55
Ex-lignin ....lb.	...	2.35	...	2.35	2.50	2.55
Vermilion, English, kgs ..lb.	3.12	3.17	3.12	3.17	3.12	3.17
W						
Wattle Bark, bgs ....ton	41.00	43.00	41.00	43.00	37.50	43.00
Extract, 60°, tks, bbls ..lb.	.046	.0475	.046	.0475	.03⅞	.05
Wax, Bayberry, bgs ..... lb.	.18	.20	.18	.20	.18	.20
Bees, bleached, white 500 lb slabs, cases ....lb.	...	.58	...	.58	.36½	.56
Yellow, African, bgs ..lb.	...	.49	...	.49	.30	.47
Brazilian, bgs .....lb.	...	.50	...	.50	.31	.50
Refined, 500 lb slabs, cases lb.	.55	.56	.55	.56	.35	.52
Candelilla, bgs ....lb.	...	.33	...	.33	.19	.33
Carnauba, No. 1, yellow, bgs ....lb.	...	.88	...	.88	.68	.88
No. 2, yellow, bgs ...lb.	...	.87	...	.87	.66	.85
No. 2, N. C., bgs ... lb.	.83	.84	.83	.84	.62	.79
No. 3, Chalky, bgs ...lb.	.76	.77	.76	.77	.55	.78
No. 3, N. C., bgs ....lb.	.78	.79	.78	.79	.58	.79
Ceresin, dom, bgs .....lb.	.13½	.14	.13½	.14	.11	.14
Japan, 224 lb cases ....lb.	.30	.31	.30	.31	.16½	.35
Montan, crude, bgs ....lb.	.45	.46	.45	.46	.45	.46
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.24	.25	.24	.25	.24	.25
Cakes, cases ....lb.	.25	.26	.25	.26	.25	.26
Wood Flour, c-l, bgs ....ton						
bgs, c-l, wks ....ton	24.00	25.00	24.00	25.00	24.00	25.00
Whiting, chalk, com 200 lb	18.00	19.00	18.00	19.00	18.00	19.00
Gilders, bgs, c-l, wks ..ton	16.00	20.00	16.00	20.00	16.00	20.00
X						
Xylol, frt all'd, East 10° tks, wks ....gal.	...	.27	...	.27	...	.29
Com'l tks, wks, frt all'd gal.	...	.27	...	.27	.26	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Z						
Zein, bgs, 1000 lb lots, wks ....lb.	...	.20	...	.20	...	.20
Zinc Acetate, tech, bbls, lcl, delv ....lb.	.16	.17	.16	.17	.15	.16
Arsenite, bgs, frt all'd ..lb.	...	.12	...	.12	...	.12
Carbonate tech, bbls, NY lb.	.14	.20	.14	.20	.14	.20
Chloride fused, 600 lb drs, wks ....lb.	...	.05	...	.05	...	.05
Gran, 500 lb drs, wks lb.	...	.0575	...	.0575	...	.0575
Soln 50%, tks, wks 100 lb.	...	2.50	...	2.50	2.25	2.50

(*FP*) Full Priority. (*PC*) Price Control.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Zinc (continued)						
Cyanide, 100 lb drs . . . . lb.	.33	.37	.33	.37	.33	.37
Dust, 500 lb bbls, c-l, delv lb.	...	.1035	...	.1035	.09¼	.1035
Metal, high grade slabs, c-l,						
NY (*FP*) (*PC*) 1000 lb.	...	8.65	...	8.65	7.65	8.64
E. St. Louis . . . . . 100 lb.	...	8.25	...	8.25	7.25	8.25
Oxide, Amer, bgs, wks lb.	...	.07¼	...	.07¼	.06½	.07¼
French 300 lb bbls, wks lb.	...	.07¼	...	.07¼	.06¾	.07¼
Palmitate, bbls . . . . lb.	.32	.33	.32	.33	.24½	.33
Resinate, fused, pale bbls lb.	...	.10	...	.10	...	.10
Stearate, 50 lb bbls . . . . lb.	.30	.31	.30	.31	.22	.31
Sulfate, crys, 40 lb bbls						
wks . . . . lb.	...	.365	...	.365	.315	.365
Flake, bbls . . . . lb.	...	.405	...	.405	.335	.405
Sulfide, 500 lb bbls, delv lb.	...	.08	...	.08	...	.08
bgs, delv . . . . lb.	.14	.14¼	.14	.14¼	.08	.13¼
Sulfocarbolate, 100 lb kgs lb.	.24	.29	.24	.29	.03⅜	.07¾
Zirconium Oxide, crude,						
70-75% grd, bbls, wks ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Babassu, tks, futures . . . . . lb.	no prices		no prices		...	.06
Castor, No. 3, 400 lb drs lb.	...	.12½	...	.12½	.0180	.12½
(*PC*) Blown, 400 lb drs lb.	...	.14	...	.14	.11¾	.14
China Wood, drs, spot NY lb.	.40⅛	nom.	.40⅛	nom.	.27¼	.37¼
Tks, spot NY . . . . lb.	.38¾	nom.	.38¾	nom.	.26¼	.35½
Coconut, edible, drs NY . . lb.	no prices		no prices		.08	.15½
Manila, tks, NY . . . . lb.	no prices		no prices		.03⅜	.10
Tks, Pacific Coast . . . . lb.	...	no prices	...	no prices		.03¼
Cod, Newfoundland, 50 gal						
bbls . . . . gal.	...	.85	...	.85	.07½	.80
Copra, bgs, NY . . . . lb.	no prices		no prices		.0180	.04¼
Corn, crude, tks, mills . . . lb.	...	.12½	...	.12½	.06⅝	.13
Refd, 375 lb bbls, NY . . lb.	...	.15½	...	.15½	.14¾	.16
Degras, American, 50 gal						
bbls, NY . . . . lb.	.11½	.12⅛	.11½	.12⅛	.07½	.08¾
Greases, Yellow . . . . lb.	...	.0929	...	.0929	.04¾	.08½
White, choice, bbls, NY lb.	...	.097	...	.097	.05	.09
Lard, Oil, Edible, prime . . lb.	...	.15½	...	.15½	.08½	.14½
Extra, bbls . . . . lb.	...	.15	...	.15	.08¼	.13¾
Extra, No. 1, bbls . . . . . lb.	...	.14½	...	.14½	.08	.13¼
Linseed, Raw less than 5						
drs lots . . . . lb.	.125	.127	.125	.127	.091	.123
drs, c-l, spot . . . . lb.	.117	.119	.117	.119	.095	.190
Tks . . . . lb.	.108	.112	.108	.112	.084	.1060
Menhaden, tks, Baltimore gal.	.63¾	nom.	.63¾	nom.	.30	.60
Refined, alkali, drs . . . . lb.	.12	.124	.12	.124	.084	.122
Kettle boiled, drs . . . . . lb.	.13	.134	.13	.134	.096	.132
Light pressed, drs . . . . . lb.	.11	.114	.11	.114	.082	.112
Tks . . . . lb.	.102	nom.	.102	nom.	.072	.10
Neatsfoot, CT, 20°, bbls, NY lb.	...	.25¾	...	.25¾	.18¼	.26½
Extra, bbls, NY . . . . lb.	...	.14½	...	.14½	.08¼	.14
Pure, bbls, NY . . . . lb.	...	.17¾	...	.17¾	.12¼	.17¾
Oiticica, bbls . . . . lb.	.25¼	nom.	.25¼	nom.	16½	.23½
Oleo, No. 1, bbls, NY . . . lb.	...	.13¼	...	.13¼	.07⅜	.13¼
No. 2, bbls, NY . . . . lb.	...	.13	...	.13	.07⅜	.13
Olive, denat, bbls, NY . . gal.	4.00	4.50	4.00	4.50	2.25	4.25
Edible, bbls, NY . . . . . . gal.	5.00	5.30	5.00	5.30	4.75	5.30
Foots, bbls, NY . . . . lb.	.19	nom.	.19	nom.	.10¼	.19
Palm, Kernel, bulk . . . . . . lb.	no prices		no prices		no prices	
Niger, cks . . . . lb.	.09¼	nom.	.09¼	nom.	.04¼	.09
Sumatra, tks . . . . lb.	no prices		no prices		.02	.09
Peanut, tks, f.o.b. mill . . . lb.	.13	...	.13	...	.05¼	.16
Refined, bbls, NY . . . . . lb.	.16¾	nom.	.16¾	nom.	.08	.16
Perilla, drs, NY . . . . lb.	...	.246	...	.246	.18	.23
Tks, Coast . . . . lb.	...	.2380	...	.2380	.16½	.21½
Pine, see Pine Oil, Chem. Sec.						
Rapeseed, blown, bbls, NY lb.	.18	.18½	.18	.18½	.16½	.18
Denatured, drs, NY . . gal.	...	nom.	...	nom.	.95	1.00
Red, Distilled, drs . . . . lb.	.12¾	.14	.12¾	.14	.07¼	.13
Tks . . . . lb.	.12	.12½	.12	.12½	.06¼	.11½
Sardine, Pac Coast, tks . . gal.	...	.66½	...	.66½	.39	.62½
Refined alkali, drs . . . . . lb.	.12	.124	.12	.124	...	...
Light pressed, drs . . . . . lb.	.11	.114	.11	.114	.084	.122
Tks . . . . lb.	.102	nom.	.102	nom.	.078	.112
Soy Bean, crude						
Dom, tks, f.o.b. mills . . lb.	.12¼	nom.	.12¼	nom.	.05⅜	.12¾
Crude, drs, NY . . . . . . lb.	.13	nom.	.13	nom.	.06¼	.12¼
Ref'd, drs, NY . . . . lb.	.14¼	nom.	.14¼	nom.	.05½	.12¼
Tks . . . . lb.	.13½	nom.	.13½	nom.	.07⅝	.13½
Sperm, 38° CT, bleached						
(*FP*) bbls, NY . . . . . . lb.	.1301	nom.	.1301	nom.	.11	.127
45° CT, blchd, bbls, NY lb.	.1278	nom.	.1278	nom.	.103	.12
Stearic Acid, double pressed						
dist bgs . . . . lb.	.15	.16½	.15	.16½	.09½	.13¾
Double pressed saponified						
bgs . . . . lb.	.15¼	.16¾	.15¼	.16¾	.09¾	.14
Triple pressed dist bgs lb.	.18	.19½	.18	.19½	.12½	.16½
Stearine, Oleo, bbls . . . . . . lb.	...	.11	...	.11	...	.09
Tall, crude, drs, c-l, wks ton	...	40.00	...	40.00	...	...
tks, wks . . . . ton	...	30.00	...	30.00	...	...
dist, drs, c-l, delv . . . . . lb.	...	.04	...	.04	...	...
tks, wks . . . . lb.	...	.03½	...	.03½	...	...
Tallow City, extra loose . . lb.	...	.097¼	...	.097¼	...	.07⅜
Edible, tierces . . . . lb.	no prices		no prices		...	.05⅛
Acidless, tks, NY . . . . . . lb.	.13	nom.	.13	nom.	.07½	.11½
Turkey Red, single, drs . . lb.	...	.08¾	...	.08¾	.06½	.08¼
Double bbls . . . . lb.	...	.12	...	.12	.09½	.11
Whale:						
Winter bleach, bbls, NY lb.	...	.1110	...	.1110	..099	.1110
Refined, nat, bbls NY . . lb.	...	.1070	...	.1070	.095	.1070

(*FP*) Full Priority. (*PC*) Price Control.

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industries are bound to welcome an extensive Latin-American trade when the war is over. To prepare now to obtain the largest possible share of this potential market's post-war business, would be to act wisely. This advertiser, a well-rated firm long established in the Chemical field in Mexico, is ready to act as representative, agent or exclusive distributor for leading manufacturers interested in Mexico. Correspondence in English.

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PAX

Index to Advertisers

Index to Advertisers

"We"—Editorially Speaking

To W. W. Duecker and E. W. Eddy, both of Texas Gulf Sulphur, we owe a debt of gratitude for the painstaking work that they have been indulging in for weeks preparing the manuscript "Sulfur's Role in Industry"—a story, by the way, that to the best of our knowledge and belief, has never been told in just the way that these authors have approached the subject. And just to keep the record straight, we want to publicly apologize to Mrs. Duecker for she was most gracious about "Dueck" spending two solid weekends in complete seclusion putting on the finishing touches to the article.

If you missed the Gilbert and Sullivanesque rendition of "Three Little Editors" by Messrs. Howe, Kirkpatrick and Murphy at the recent joint meeting of the Junior Chemical Engineers of New York and the New York Section of the A. I. Ch. E., you didn't miss much. Guess we collectively better stick to pen-pushing and the hunt-and-peck typewriter system as a means of making livelihoods. As tenors we are pretty good editors.

The drive launched by the Packaging Institute and the Collapsible Tube Manufacturers Association to collect some 20-25 tons of tubes discarded daily is well worthy of mention. Some 60,000 drug stores are co-operating and 200,000 posters will publicize the drive. The drug wholesalers will do the actual collecting and forwarding to Hillside, N. J., where special tin-recovery and smelting equipment is being installed by what is to be known as the Tin Salvage Institute. And while we are on the subject of salvage, why not appoint Junior or Mary your official Salvage Warden. A lot depends on how efficiently we make use of what we have in the way of waste materials.

A word of appreciation is certainly due M. R. Bhagwat for his splendid services of the last ten years on the Chemists' Advisory Council. Unselfishly he has struggled against great odds to help the unemployed chemist and chemical engineer. Nor can it be said that his work has been in vain—indeed it has not been appreciated to anything like the degree that it should. But we feel sure his real compensation is the cherished memory of all those he was able to help in a practical way.

Priorities
Allocations
Price Controls

See the Statistical and Technical Data Section (Part 2 of this issue) for digest of Government Regulations of Materials and Prices. Invaluable to you in your work!

There is a movement on, so we are told, to change the name of the Salesmen's Association of the American Chemical Industry to the Priorities and Allocations Experts of America. And only a few months ago chemical company executives were wondering what to do with sales forces!

Engineers will dominate the postwar world, Dr. Edwin S. Burdell, director of Cooper Union, predicts. "When we emerge from this second World War we will be so much poorer as a nation that only the engineer will have the skills to restore the material goods which we shall need so badly," according to Dr. Burdell.

"While our American standard of living will suffer, it appears likely that the European nations will be so poverty stricken that the world's resources will have to be marshalled for their reconstruction. The engineers and their corps of mechanics and skilled workers will be the most needed men in the world of tomorrow."

Sounds pretty good for the engineers anyway.

Do not have any fears that censorship will dull the contents of future issues of Chemical Industries. We are busy preparing a most tasty dish for March and subsequent issues. Included in the program for the immediate future are: "United States Guards Against Sabotage," written by John Edgar Hoover, Director, Federal Bureau of Investigation (FBI); "Twenty Years in the Alkali Industry," by David Aronson; "Plastics and Resins in Process Equipment," written by a selected group of Bakelite engineers; "The Maintenance of Health in the Chemical Industry," by Dr. Henry F. Smyth, Jr., Mellon Institute; and several other articles of equally timely interest to executives of the industry who primarily are responsible for the output of the chemical industry under war conditions.

Nor are the problems of chemical consumers forgotten. In March you will read all about the furfural plastics—a most opportune time to present the advantages of this important group in the plastics field.

And we would be really holding out on you if we did not at least mention that Maurice Crass, Jr., Assistant Secretary of the Manufacturing Chemists' Association, will in the March issue outline the problems on packaging that war has created and just what measures are being taken to meet this emergency.

If you are one of those who still wonders why chemicals are scarce despite the fact that we have the largest industry in the world, you may begin to see the light by glancing through the following list—it shows chemicals Washington has agreed to supply Latin America within the first three months of '42. And, of course, Lend-Lease is still something else again.

Acetone	100,000 lb.
Ammonia, anhydrous	795,000 lb.
Ammonium sulfate	10,100,000 lb.
Aniline	95,000 lb.
Carbon tetrachloride	140,000 lb.
Caustic soda	35,000,000 lb.
Chlorine	500,000 lb.
Chromium tanning chemicals	565,000 lb.
Citric Acid	620,000 lb.
Copper sulfate	17,500,000 lb.
Formaldehyde	175,000 lb.
Glycerine	350,000 lb.
Methyl alcohol	55,000 gal.
Phosphorus	69,000 gal.
Plastics	150,000 lb.
Potash salts	3,500,000 lb.
Potassium permanganate	50,000 lb.
Soda ash	47,500,000 lb.
Sulfuric acid	2,000,000 lb.
Superphosphate	17,500,000 lb.

And in closing—what about the Salary Allotment Plan for the purchase of bonds? Every company in the chemical field should participate. If you want additional information write, phone or wire "Phil" Dinkins of American Cyanamid for the details. A "Free America" is the only kind of an America worth living in.

Fifteen Years Ago

From our files of February, 1927

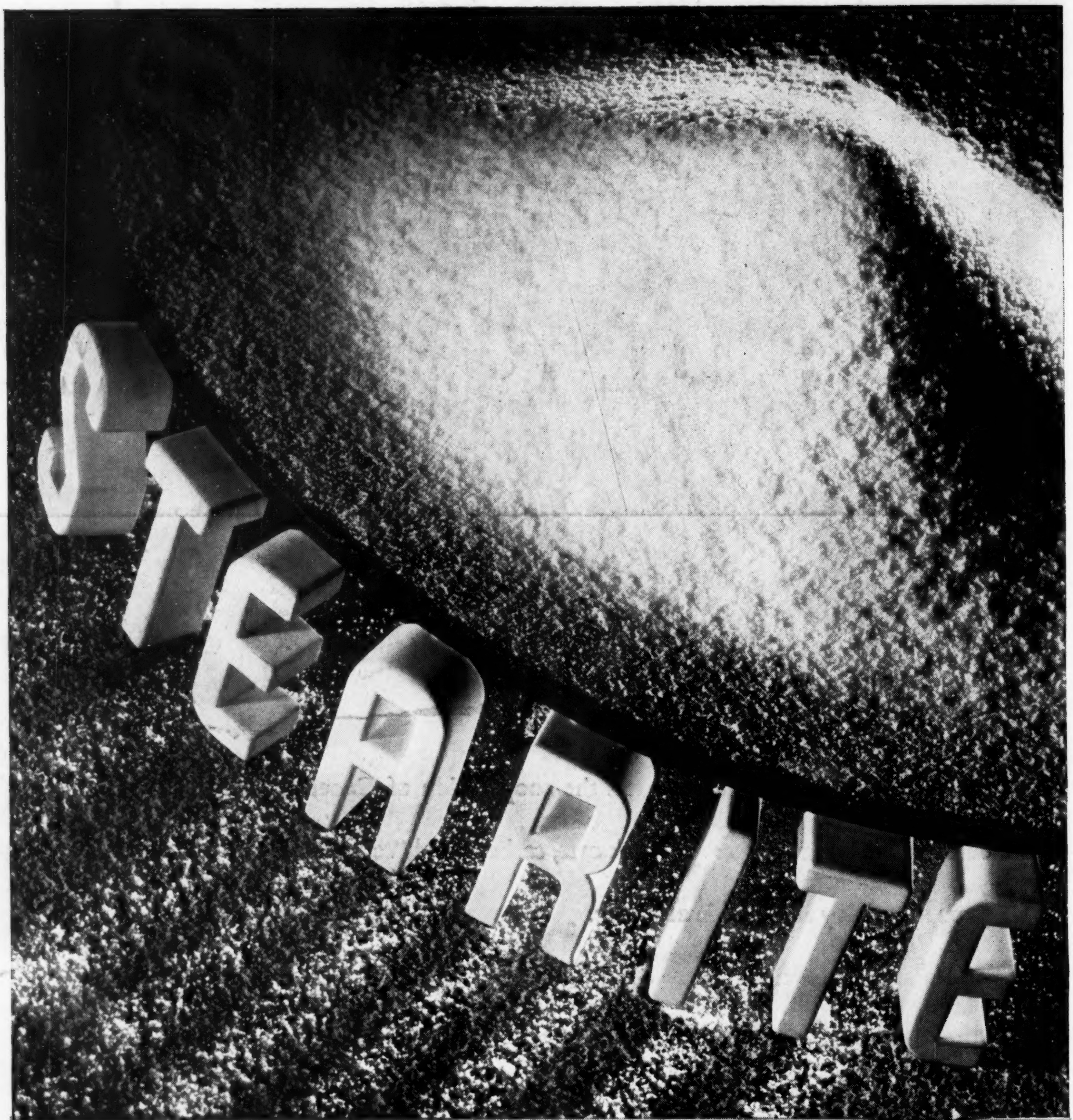
Roger Adams selected as the '27 Nichols medalist.

Allied Chemical reports plans for huge fertilizer plant to be erected at Hopewell, Va.

S. W. Allender, formerly Monsanto's P. A., is now assistant superintendent of the acid and intermediate plant at Monsanto, Ill.

International Agricultural to build plant at Wales, Tenn., for production of commercial superphosphates.

C. R. Johnson joins Godfrey L. Cabot, Inc. as technical director.


STEARITE

VOL. 50 | Feb. '42

CHEMICAL INDUSTRIES

Statistical and Technical Data Section

No. 2 | Part 2

State of Chemical Trade

Current Statistics (January 31, 1942)—p. 98

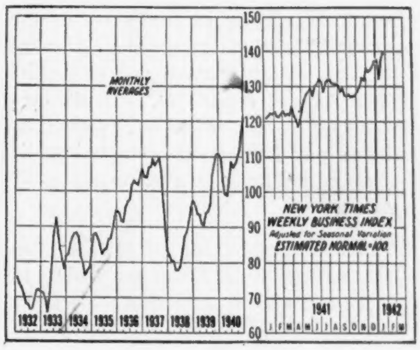
WEEKLY STATISTICS OF BUSINESS

Week Ending	Carloadings 1941	Carloadings 1940	Carloadings % of Change	Electrical Output* 1941	Electrical Output* 1940	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Ass'n Price Indices Fert. Mat.	Ass'n Price Indices Mixed Fert.	Ass'n Price Indices All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
Jan. 3	674,374	614,171	+ 9.8	3,288,685	2,845,727	+15.6	98.4	120.1	122.8	116.4	112.7	120.0	95.1	96.1	137.4	101.2
Jan. 10	737,172	711,635	+ 3.6	3,472,579	3,002,454	+15.7	100.0	120.1	129.5	117.0	112.7	121.5	95.3	96.4	132.1	102.3
Jan. 17	811,196	703,497	+15.3	3,450,468	3,012,638	+14.5	99.9	120.1	130.8	117.4	114.0	122.0	95.6	97.8	137.2	102.6
Jan. 24	817,804	710,752	+15.1	3,440,163	2,996,155	+14.8	99.9	120.1	131.8	117.4	114.0	121.8	96.5	97.7	139.6	102.5

MONTHLY STATISTICS

CHEMICAL:	Nov. 1941	Nov. 1940	Oct. 1941	Oct. 1940	Sept. 1941	Sept. 1940
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	......	......	......	......	......	222,476
Consumpt. in mfr. fert.	......	......	......	......	......	169.878
Stocks end of month	......	......	......	......	......	105,557
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal..	37,541,115	23,346,835	36,392,523	23,595,180	35,756,991	21,559,240
Comp. denat. prod., wine gal...	2,603,431	2,269.815	3,600,439	4,811,979	2,679,913	3,093,302
Removed, wine gal.	2,725.465	2,329,505	3,727,292	4,970,413	2,706,534	3,097,748
Stocks end of mo., wine gal...	137,197	516,516	260,134	580,542	370,401	742,332
Spec. denat. prod., wine gal. ...	14,361,093	10,884,671	14,584,252	10.286,463	14,228,475	10,600,396
Removed, wine gal.	14,251,186	11.210,915	14,574,328	10,589,795	14,393,773	11,059,056
Stocks end of mo., wine gal...	586,355	1,069,005	479,879	1,399,150	470,952	1,707,217
Ammonia sulfate prod., tons *a*..	61.359	62,934	63.372.9	63,898	61,675.8	62.573
Benzol prod., gal. *b*	12,037,199	11,886,000	12.435.830	12.218,000	11,177,395	11,077,000
Byproduct coke, prod., tons *a*..	4,833,483	4,763,500	4,970,652	4,853,600	4,805,793	4,640,700
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	1,018.435	661,258	1,016,077	748,779	982,817	736,372
Sheets, ship., lbs.	1,095,382	730,384	1,052,598	767,010	1,022,014	745,068
Rods, prod., lbs.	337,228	306,670	334,111	248,384	334,579	256,678
Rods, ship., lbs.	345,694	305,657	411,953	273,758	410,546	282.714
Tubes, prod., lbs.	127,349	92,766	171,123	99,236	161,655	100.236
Tubes, ship., lbs.	127,572	94,958	165,588	95,183	132,549	85,636
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	557,758	934,006	630,357	983,292	585,441	826.248
Shipments, lbs.	609,165	1,036,674	712,099	944,361	621,557	754,786
Molding comp., ship.; lbs. ...	2,777,317	1,410,496	3,453,048	1,783,269	2,813,225	1,501,463
Methanol (Bureau of the Census)						
Production, crude, gals.	......	......	......	......	......	407,764
Production, synthetic, gals.	......	......	......	......	......	3,787,794
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds...	4,072,081	3,318,461	4,285,874	3,303,892	4,600,150	2,698,218
Heavy goods, ship., linear yds..	2,900,534	2,457,154	3,532,725	2,538,265	3,199,908	2,408,096
Pyroxylin spreads, lbs. *c*	6,522,824	5,775,919	7,488,494	5,851,135	7,097,098	5,127,772
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*..	......	......	......	......	$23,461	$20,000
Crude sulfur *d*	......	......	......	......	$1,374	$874
Coal-tar chemicals *d*	......	......	......	......	$2,331	$1,114
Industrial chemicals *d*	......	......	......	......	$4,607	$4,152
Imports						
Chemicals and related prod. *d*..	......	......	......	......	$5,892	$11,338
Coal-tar chemicals *d*	......	......	......	......	$901	$1,494
Industrial chemicals *d*	......	......	......	......	$1,245	$1,254
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	147.3	125.3	148.1	125.4	146.1	123.0
Other than petroleum	151.9	126.4	152.7	126.5	150.5	123.1
Chemicals	183.3	148.0	182.5	145.6	182.2	143.4
Explosives	Not Available		Not Available		Not Available	
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	193.4	139.4	190.7	139.3	186.4	138.1
Other than petroleum	201.8	141.2	197.7	140.2	192.0	137.8
Chemicals	265.2	181.7	249.4	176.2	250.4	170.9
Explosives	Not Available		Not Available		Not Available	
Price index chemicals*	88.3	85.1	88.4	85.0	88.2	84.8
Drugs & Pharmaceuticals* ...	123.2	95.9	124.1	95.8	104.4	96.2
Fert. mat.*	77.3	69.9	77.3	68.1	76.6	68.0
Paint and paint mat.	95.3	85.7	96.0	84.8	94.7	84.2
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ...	......	......	......	......	136,503	145.902
Total phosphate rock	......	......	......	......	84,377	82,336
Total potash fertilizers	......	......	......	......	14,205	12,552
Imports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ...	......	......	......	......	102,601	68,128
Sodium nitrate	......	......	......	......	60,352	37,610
Total potash fertilizer	......	......	......	......	5,313	7,787

Industrial Trends



Business: Complete curtailment of the automobile production and restrictions placed on other civilian industries is offset by large gains in other lines so that activity remains at high levels. Industrial production declined less than seasonally in December and first half of January. The Federal Reserve Board's index of production rose to 168 per cent. of the 1935-1939 average. The Conference Board index of manufacturer's shipments showed an increase of 6 per cent. from 201 in November to 213 in December. The *New York Times* index of business activity went from 136.9 for week ending Dec. 27 to 139.4 for week ending Jan. 31.

Steel: The steel industry continues at peak operating levels.

Production of finished steel products in 1941 totaled 65,361,688 net tons, an increase of 16,776,828 net tons, or 34.5 per cent. over the 48,585,860 net tons produced in 1940.

The past year saw a record ore movement in the Lake Superior region. All records were broken with a total of 80,116,360 gross tons, 25.75 per cent. above the 1940 total.

Carloadings: Railroad freight traffic in week ending January 31 declined slightly from the preceding week at a time when a seasonal increase usually occurs.

Carloadings in first five weeks of 1942 totaled 3,858,273 cars compared with 3,454,409 cars in like period at 1941, an increase of 11.7 per cent.

Electric Output: Production of power in the United States during week ended January 31 amounted to 3,448,193,000 kilowatt hours, an increase of 0.8 per cent.

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over output of preceding week, according to the Edison Electric Institute.

Automotive: Production of automobiles has practically ceased and with remarkable speed the industry is becoming the backbone of armament production.

Construction: Building and engineering contracts awarded in the 37 eastern states during January amounted to $318,846,000 according to F. W. Dodge Corp. This represents a moderate increase over the $305,204,000 recorded for January 1941. In dollar volume, non-residential building was up 4 per cent. from the corresponding month of 1941, residential building was down 8 per cent., and public works and utilities construction was up 21 per cent.

Textiles: Production of textiles declined somewhat in December owing to reduction in activity at cotton mills from the record level reached in November. Output of wool and rayon textiles was at about capacity.

Retail Trade: Retail trade of the nation recorded 1941 as its biggest year yet. According to the Department of Commerce retail outlets did a business of $53,600,000,000 in 1941. This total is 17 per cent. higher than for 1940, and 11 per cent. more than 1929, previous record year. It is to be noted however that nearly half the gain over 1940 was caused by higher prices, while the remainder of the gain was contributed to actual increase in sale of goods.

Commodity Prices: According to the Federal Reserve System, wholesale commodity prices increased sharply when this country entered the war early in December, and then showed little change in the latter half of the month. In first half of January prices again advanced, the principal increases being in agricultural commodities and chemicals.

Outlook: It seems evident that the country has only recently been shocked into seriousness by our reverses in the Far East. Worry and fear for our success has finally made the people intolerant of the bungling carelessness, and inefficiency that seems to have existed in our war program. This attitude of the public is probably the best thing that could have happened, and maybe now some of the red tape and confusion can be eliminated and an opportunity given the technical and business men to produce.

All emphasis will be placed on production for the prosecution of the war with curtailment of civilian commodities. Manufacturers who don't make an attempt to share in necessary work will be hard hit. Stricter and more extensive control of raw materials and prices, and possibility of priorities on transportation will encourage participation.

MONTHLY STATISTICS (cont'd)

FERTILIZER: (Cont'd)	Nov. 1941	Nov. 1940	Oct. 1941	Oct. 1940	Sept. 1941	Sept. 1940
Superphosphate e (Nat. Fert. Association)						
Production, total	374,649	345,352	373,413	354,691	330,688	278,103
Shipments, total	299,753	176,928	332,336	317,425	385,647	371,539
Northern area	135,196	71,201	156,537	179,139	288,090	292,234
Southern area	164,557	105,727	175,799	138,286	97,557	79,305
Stocks, end of month, total	1,486,673	1,571,998	1,365,692	1,362,129	1,274,197	1,275,841
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	188,830	106,119	182,588	206,569	204,039	242,844
Total, 12 southern	186,453	105,003	168,534	188,799	135,239	142,636
Total, 5 midwest	2,377	1,116	14,054	17,770	68,800	100,208
Fertiliser employment *i*	102.3	92.4	103.6	96.7	110.2	95.6
Fertiliser payrolls *i*	99.5	76.5	102.7	82.4	111.6	85.4
Value imports, fert. and mat. *d*	......	......	......	......	$2,435	$1,311
GENERAL:						
Acceptances outst'd'g *f*	$193	$196	$184	$186	$176	$176
Coal prod., anthracite, tons	3,832,000	3,980,000	5,382,000	4,355,000	5,143,000	4,053,000
Coal prod., bituminous, tons	42,865,000	40,012,000	49,800,000	38,700,000	46,880,000	38,413,000
Com. paper outst'd'g *f*	$387	$231	$377	$252	$370	$250
Failures, Dun & Bradstreet	842	1,086	809	1,111	735	976
Factory payrolls *i*	165.5	125.1	166.7	116.2	163.0	111.6
Factory employment *i*	134.1	114.2	132.5	111.4	132.4	111.4
Merchandise imports *d*	......	......	......	......	$262,680	$194,928
Merchandise exports *d*	......	......	......	......	$406,057	$288,270
GENERAL MANUFACTURING:						
Automotive production	352,347	256,101	382,000	493,223	234,255	269,108
Boot and Shoe prod., pairs	34,701,613	36,565,529	45,246,238	37,027,350	43,375,891	35,092,360
Bldg. contracts, Dodge *j*	......	......	606,349	383,069	623,292	347,651
Newsprint prod., U. S. tons	......	......	......	......	78,657	77,888
Newsprint prod., Canada, tons.	......	......	......	......	298,276	282,322
Glass containers, gross‡	......	......	......	......	6,286	4,289
Plate glass prod., sq. ft.	......	......	......	......	1,123,200	1,002,000
Window glass prod., boxes	......	......	......	......	14,905,000	14,090,800
Steel ingot prod., tons	6,969,987	6,469,107	96.4	90.6	6,819,706	6,056,246
% steel capacity	98.3	96.6	99.0	96.1	7,242,683	6,644,542
Pig iron prod., tons	4,702,927	4,403,230	4,856,306	4,445,961	4,716,901	4,176,527
U.S. cons'pt. crude rub., lg. tons	......	......	60,418	59,644	53,655	52,469
Tire shipments	4,047,913	4,968,533	5,867,175	5,525,075	5,264,357	4,462,486
Tire production	3,964,067	4,731,995	4,834,308	5,076,951	4,583,324	4,412,574
Tire inventories	4,042,995	9,162,995	4,122,836	9,409,683	5,170,008	9,837,395
Cotton consumpt., bales	......	......	953,600	770,832	875,682	770,702
Cotton spindles oper.	23,069,146	22,685,622	23,043,310	22,456,588	22,963,944	22,281,476
Wool consumption *s*	......	......	60.6	45.9	58.6	38.3
Rayon deliv., lbs.	......	......	......	......	37,000,000	30,900,000
Rayon employment *i*	322.3	314.5	325.0	311.1	327.0	311.7
Rayon payrolls *i*	384.8	331.4	386.4	322.6	374.3	327.7
Soap employment *i*	96.4	84.5	97.7	88.8	98.2	87.9
Soap payrolls *i*	138.4	100.2	142.2	107.2	139.6	107.0
Paper and pulp employment *i*	128.5	115.7	128.2	115.1	128.3	116.7
Paper and pulp payrolls *i*	166.7	123.8	165.2	123.8	163.0	124.2
Leather employment *i*	98.1	83.9	96.6	81.6	97.0	79.0
Leather payrolls *i*	118.5	82.8	116.4	81.6	114.2	76.8
Glass employment *i*	133.9	117.0	132.3	113.2	130.3	109.3
Glass payrolls *i*	169.5	130.8	173.7	129.8	161.0	120.7
Rubber prod. employment *i*	111.8	94.4	111.8	92.6	111.5	89.4
Rubber prod. payrolls *i*	140.9	102.0	138.3	99.5	134.2	95.7
Dyeing and fin. employment *i*	133.1	132.0	135.1	128.6	136.0	124.8
Dyeing and fin. payrolls *i*	133.2	113.5	135.9	111.4	135.7	106.5
MISCELLANEOUS:						
Oils & Fats Index ('26 = 100)[1]	136.9	......	140.9	48.6	142.5	49.3
Gasoline prod., *p*	......	......	63,288	52,907	60,167	52,313
Cottonseed oil consumpt., bbls.	......	......	297,353	317,548	297,635	292,553
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments, dollars	$41,367,698	$31,892,256	$51,138,488	$39,179,174	$50,363,488	$35,327,356
Trade sales (580 estbts.) dollars	$18,804,182	$15,115,083	$24,724,475	$19,638,441	$25,624,958	$18,416,711
Industrial sales, total, dollars	$18,726,637	$14,048,944	$21,453,628	$15,953,121	$19,709,134	$13,458,969
Paint & Varnish, employ. *i*	142.6	125.9	144.0	125.1	143.9	126.1
Paint & Varnish, payrolls *i*	170.0	135.7	173.7	135.8	169.9	135.6

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted. 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census, in millions of lbs.; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940; [1] Revised series beginning February, 1940.

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Hercules Powder Earns $4.23 a Share

Hercules Powder Co., Inc., in report for year ended December 31, 1941, shows consolidated net income of $6,098,712 after depreciation, amortization, provision of $500,000 for contingencies and reserve of $13,792,591 for federal taxes on income, including $10,012,005 for United States excess profits taxes. Above net income is equal after deducting dividends on 6% preferred stock, to $4.23 a share on 1,316,-710 no-par shares of common stock, excluding 38,958 treasury shares.

This compares with net income in 1940 of $5,807,769 or $4.01 a common share.

Current assets as of December 31, last, amounted to $48,852,373 and current liabilities, including $9,716,190 contract advances, were $26,899,704. These compare with current assets of $45,040,215 and current liabilities, including $19,431,238 contract advances, of $25,693,688 at end of preceding year.

Du Pont Nets $90,401,470

E. I. du Pont de Nemours & Co. and subsidiaries in preliminary report for year ended December 31, 1941, show net income of $90,401,470 after depreciation, obsolescence, interest, federal taxes, etc., and after a charge of $10 million for special contingency reserve. Above net income is equal, after deducting preferred dividends and including company's equity in undivided profits or losses of controlled companies not wholly owned, to $7.50 a share on common stock.

This compares with net income of $86,-945,173 or $7.23 a common share in 1940, after $10 million special contingency reserve.

Freeport Sulphur Reports Profit of $3,149,030

Freeport Sulphur Co. in preliminary report for year ended December 31, 1941, shows net profit of $3,149,030 after depreciation, depletion, federal income taxes, etc., equal to $3.95 a share on 796,380 shares of common stock.

This compares with $3,033,471 or $3.81 a share in 1940.

Of Freeport's earnings $657,862 or 82 cents a share represented the company's portion of the earnings of its subsidiary, Cuban-American Manganese Corp., compared with $956,852 or $1.20 a share as its portion in 1940.

Preliminary report of Cuban-American Manganese Corp. for year 1941 showed net profit of $732,297 after depreciation, depletion, United States and Cuban income taxes, etc., comparing with $1,062,-800 in 1940.

Dividends and Dates

Name	*Per Share*	*Stock Record* (Feb.)	*Payable*
Abbott Laboratories, 4½% pref. (final)	1.47		Feb. 11
Atlas Powder Co. ..	.75	27	Mar. 10
Columbian Carbon Co.	1.00	20	Mar. 10
Dow Chemical Co., Common	.75	2	Feb. 16
5% pref. (quar.)	1.25	2	Feb. 16
Freeport Sulphur Co. (quar.)	.50	17	Mar. 2
Harshaw Chemical Co., 4½% pref.(quar.)	1.33 1/3	20	Mar. 2
Hercules Powder Co. 6% pref. (quar.)..	1.50	2	Feb. 13
Heyden Chemical Corp., common ...	.75	18	Mar. 2
4¼% pref. A (quar.)	1.06¼	18	Mar. 2
Hooker Electrochemical Co.	.40	13	Feb. 28
Lindsay Light & Chemical Co.	.20	7	Feb. 20
Monsanto Chemical Co., com. (quar.).	.50	10	Mar. 2
$4.50 pref. A (s. a.)	2.25	9	June 1
$4.50 pref. B (s. a.)	2.25	9	June 1
$4.00 pref. C (s. a.)	2.00	9	June 1
New Jersey Zinc Co..	.50	20	Mar. 10
Standard Oil Co. (Indiana) (quar.) ..	.25	14	Mar. 16
Texas Gulf Sulphur Co. (quar.)	.50	2	Mar. 16
Vick Chemical Co. (quar.)	.50	16	Mar. 2
Extra	10	16	Mar. 2
Westvaco Chlorine Products Corp. (common)	.35	16	Mar. 5

Earnings Statements Summarized

Company	Annual dividends •	Net income 1941	Net income 1940	Common share earnings 1941	Common share earnings 1940	Surplus after dividends 1941	Surplus after dividends 1940
American Agricultural Chemical Co.:							
December 31 quarter ...	y$1.45	$140,567	†$122,458	$.22	....	......	......
Six months, December 31	y1.45	336,189	†240,300	.53	....	......	......
Atlas Powder Co.:							
Year, December 31	k4.50	1,904,601	1,784,429	6.13	5.71	$426,025	$378,008
Cuban-American Manganese Corp.:							
nYear, December 31	...	732,297	1,062,800	...	....	......	......
du Pont (E. I.) de Nemours & Co.:							
n Year, December 31 ...	y7.00	90,401,470	86,945,173	7.50	7.23	......	......
Freeport Sulphur Co.:							
nYear, December 31	y2.00	3,149,030	3,033,471	3.95	3.81	......	......
Hercules Powder Co.:							
Year, December 31	y3.00	6,098,712	5,807,769	4.23	4.01	1,623,654	1,530,218
Hooker Electrochemical Co.:							
Year, November 30	y1.30	1,182,511	1,089,027	4.12	3.71	......	......
Lindsay Light & Chemical Co.:							
n Year, December 31 ...	y.80	111,779	94,431	1.57	1.28	......	......
Mathieson Alkali Works:							
Year, December 31	y1.75	1,743,628	1,587,812	1.90	1.72	$127,826	$179,053
New Jersey Zinc Co.:							
December 31 quarter ..	k4.00	2,559,481	3,122,351	1.30	1.59	......	......
Year, December 31	k4.00	9,592,871	8,236,815	4.88	4.19	......	......
Procter & Gamble Co.:							
December 31 quarter	y3.00	6,040,701	5,020,035	.92	.76	......	......
‡‡Six months, Dec. 31...	y3.00	13,015,305	9,610,027	1.98	1.45	......	......
United Gas Improvement Co. only:							
nYear, December 31	k.75	20,606,189	26,391,349	.72	.97	......	......

a On Class A shares; *b* On Class B shares; *c* On Combined Class A and Class B shares; *d* Deficit. *f* No common dividend; *j* On average number of shares; *k* For the year 1940; *b* On Preferred stock; On Class A shares; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; *n* Preliminary statement; *h* On shares outstanding at close of respective periods. ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period. ‡‡ Indicated earnings as compiled from quarterly reports. † Net loss. * Not available. ¶¶ Before interest on income notes. *x* Paid on or declared in last 12 months plus extra stock. *w* Last dividend declared, period not announced by company.

Price Trend of Representative Chemical Company Stocks

	Jan. 3	Jan. 10	Jan. 17	Jan. 24	Net gain or loss last mo.	Price on Jan. 25 1941	1941 High	1941 Low
Air Reduction Co.	37¾	37¼	35⅝	35¾	— 2	41½	45	34⅝
Allied Chemical & Dye	146½	143½	141	137½	— 9	155	167½	135¼
Amer. Agric. Chem.	21¼	21	22⅝	22	— ¼	16½	22⅞	14⅝
Amer. Cyanamid "B"	41⅝	38½	37½	37¼	— 4⅜	34¾	42⅜	31
Columbian Carbon	70	71½	72	71	+ 1	80	83	64
Commercial Solvents	9½	9¾	9⅜	9½	...	10¼	11⅞	7½
Dow Chemical Co.	124¼	117¼	118½	115	— 9¼	134	141¾	111⅛
du Pont	144	135⅝	130⅛	126⅝	—17⅜	155	164¾	126⅝
Hercules Powder	70½	70¾	70½	70¾	+ ¼	73½	80¼	65¼
Mathieson Alkali Works	28¾	29	29	29¼	+ ½	29⅞	31¼	24⅛
Monsanto	92	85⅛	84¼	84	— 8	109	94	77
Standard Oil of N. J.	41	38⅞	40⅜	41⅜	+ ⅜	43⅛	46⅞	33
Texas Gulf Sulphur	34¼	34	34½	34¼	...	34⅞	38⅞	30⅛
Union Carbide & Carbon	74¾	69⅝	70	68	— 6¾	84⅞	79⅞	60
United Carbon Co.	39¼	40	42½	42½	+ 3¼	...	52	35
U. S. Industrial Alcohol	31	32¾	31½	31½	+ ½	21½	33½	20

Atlas Powder Nets $6.13 a Share

Atlas Powder Co. in report for year ended December 31, 1941, shows net income of $1,904,601 after depreciation, amortization, federal income and excess profits taxes, etc., equal after 5% preferred dividend requirements, to $6.13 a share on 254,827 no-par shares of common stock, excluding shares held by company. This was after deduction of $4,621,-214 for federal income, excess profits and capital stock taxes and after deduction of $350,000 to establish a reserve for contingencies arising out of the war.

This compares with $1,784,429 or $5.71 a share on 252,278 shares of common stock in 1940. Provision for federal taxes in 1940 was $1,105,891.

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Chemical Stocks and Bonds

PRICE RANGE 1941/2 January Last	1941/2 High	1941/2 Low	1940 High	1940 Low	1939 High	1939 Low	Stocks	Par $	Shares Listed	Dividends 1941*	Earnings** $-per-share-$ 1941	1940	1939
NEW YORK STOCK EXCHANGE													
48½	55¾	46	70¼	49¼	71½	53	Abbott Labs.	No	755,204	1.60	...	2.89	2.61
35½	45	34⅝	58⅛	36½	68	45¼	Air Reduction	No	2,711,137	2.00	...	2.38	1.98
139¼	167½	135	182	135½	200½	151½	Allied Chem. & Dye	No	2,401,288	6.00	...	9.43	9.50
22	22⅞	14⅜	21	12⅛	24½	16	Amer. Agric. Chem.	No	627,981	1.45	...	1.45	1.22
9¼	9⅞	4⅝	8¼	4⅛	11⅞	5½	Amer. Com. Alcohol	No	280,934	...	...	.22	—.38
33⅞	35	26	35½	23	37	21	Archer-Dan.-Midland	No	545,416	1.85	...	5.71	3.82
63½	72¼	61	80½	57	71	50	Atlas Powder Co.	No	254,827	4.50	6.13	5.71	3.82
116	121	111	124¾	112½	127	116	5% conv. cum. pfd.	100	68,597	5.00	...	26.01	18.94
19⅞	29¾	18½	35½	20	30¼	13⅝	Celanese Corp. Amer.	No	1,112,788	2.00	...	3.38	3.53
120	122⅛	116¾	121	105½	109⅞	84	prior pfd.	100	164,818	7.00	...	38.69	38.67
13¼	16¼	10⅞	20	10⅛	18	11½	Colgate-Palm.-Peet	No	1,962,087	0.50	...	1.72	2.74
72	83	64	98¾	71	96	73	Columbian Carbon	No	537,406	4.70	...	5.71	5.32
9¼	11⅞	7½	16⅝	8	16	8⅝	Commercial Solvents	No	2,636,878	0.55	...	.91	.61
53¼	55¾	42¼	65⅛	40¼	67½	54⅞	Corn Products	25	2,530,000	3.00	...	3.10	3.32
172¾	182½	164	184	165	177	150	7% cum. pfd.	100	245,738	7.00	...	7.23	7.70
19	21	12¼	23¼	12½	32⅜	18	Devoe & Rayn. A.	No	95,000	1.00	7.08	1.14	2.08
115	141¾	111⅛	171	127¼	144⅝	101½	Dow Chemical	No	1,135,187	3.00	...	6.65	3.76
127	164¾	125⅛	189¼	146½	188½	126¼	DuPont de Nemours	20	11,065,762	7.00	7.50	7.23	7.70
124	127	120⅞	129⅜	114	124⅛	112	4½% pfd.	No	1,688,850	4.50	...	51.48	52.25
133	145½	120¼	166¾	117	186⅛	138⅛	Eastman Kodak	No	2,488,242	6.00	...	7.96	8.55
174	182½	160	180	155	183½	155½	6% cum.	100	61,657	6.00	...	325.62	337.65
35¼	41	32½	39¼	24¾	36	18¼	Freeport Sulphur	10	796,380	2.00	3.95	3.81	2.76
5¾	7½	4⅞	10	5½	10⅞	7	Gen. Printing Ink	1	735,960	0.65	...	.86	.94
14	17⅞	11	19¾	11	24½	14	Glidden Co.	No	829,989	1.50	...	1.56	1.70
42	46	35	45	30	47	34	4½% cum. pfd.	50	199,940	2.25	...	8.64	9.27
91	96	76	113¼	89⅞	112¼	93	Hazel Atlas	25	434,409	5.00	...	5.98	6.60
68	80¼	65¼	100½	69	101½	63	Hercules Powder	No	1,316,710	3.00	4.23	4.01	3.65
127	132½	123½	133½	126¼	135½	128½	6% cum. pfd.	100	96,194	6.00	...	66.38	60.87
25¼	29⅞	20¾	29	16⅜	29½	16¾	Industrial Rayon	No	759,325	2.50	...	3.51	1.77
23	27	19	47⅝	21¼	46¼	17½	Interchem.	No	290,320	1.60	...	2.47	4.10
110	113¼	107	113	91	109½	90	6% pfd.	100	65,661	6.00	...	16.99	24.27
2¼	2⅜	1	2½	1	3⅝	1½	Intern. Min. & Ch.	No	436,048	...	...	—1.57	—1.32
52½	53½	30⅛	44	18⅛	41	16	7% cum. pfd.	100	100,000	...	...	.14	1.26
27¼	31⅜	23	38⅞	19⅜	55¾	35	Intern. Nickel	No	14,584,025	2.00	...	2.30	2.39
47¾	49	38¼	39⅝	26⅞	38	29	Intern. Salt	No	240,000	3.00	...	3.98	1.92
18¼	22	17¼	23¾	14⅜	22½	14½	Kellogg (Spencer)	No	509,213	1.70	...	...	1.39
22½	45⅜	19⅛	53⅜	30	56¾	36½	Libbey Owens Ford	No	2,513,258	3.50	...	3.97	3.21
14⅜	16⅝	13	18⅝	10⅛	19	13½	Liquid Carbonic	No	700,000	1.00	...	1.72	1.62
28½	31¼	24⅛	32¾	21	37⅜	20¾	Mathieson Alkali	No	828,171	1.50	1.90	1.72	1.12
82	94	77	119	79	114¾	20¾	Monsanto Chem.	No	1,241,816	3.00	...	4.04	3.81
116	118½	112	119	110	121	110	4½% pfd. A.	No	50,000	4.50	...	57.38	54.29
118	123	115	122	113½	122½	112	4½% pfd. B.	No	50,000	4.50	...	57.38	54.29
110⅛	113½	108⅞	...	...	...	...	4½% pfd. C.	No	50,000	4.50	...	...	...
14⅜	19¼	12¼	22½	14⅛	27½	17⅞	National Lead	10	3,095,100	0.50	...	1.34	1.23
168	176	100½	176	160	173⅛	152	7% cum. "A" pfd.	100	213,793	7.00	...	28.54	27.04
142	154	138	153¾	132	145	132	6% cum. "B" pfd.	100	103,277	6.00	...	59.46	55.30
33⅝	36	26	44	28¾	46	28½	National Oil Products	4	179,829	1.95	...	3.92	3.89
9½	11⅞	5⅜	14¼	6⅛	17¾	8½	Newport Industries	1	621,359	0.75	...	0.50	0.66
48¼	54	38¾	64⅝	42	70	50	Owens-Illinois Glass	12.50	2,661,204	2.50	...	2.71	3.17
47½	61½	47½	71¾	53	66	50⅝	Procter & Gamble	No	6,409,418	2.00	...	4.37	3.80
117	120	115	118½	112½	119¾	112	5% pfd.	100	169,517	5.00	...	336.78	298.55
13	16¾	10⅛	13⅛	7⅝	17¼	9⅞	Shell Union Oil	No	13,070,625	1.00	...	1.05	0.77
27¾	35¼	18⅞	23¼	12¼	29½	15½	Skelly Oil	No	981,349	1.50	...	3.28	1.99
25	34⅛	24⅞	29	20⅜	30	22¾	S. O. Indiana	25	15,272,020	1.00	...	2.20	2.24
39⅞	46⅞	33	46½	29⅞	53½	38	S. O. New Jersey	25	27,278,666	1.00	...	4.54	3.27
8¾	9⅜	6	9¼	4¼	9⅛	4	Tenn. Corp.	5	853,696	1.00	...	1.36	0.41
37	46⅜	34½	47⅝	33	50¾	32½	Texas Corp.	25	10,876,882	2.00	...	2.90	3.02
34¼	38⅞	30⅛	37¼	26⅞	38½	26	Texas Gulf Sulphur	No	3,840,000	2.50	...	2.38	2.04
66¾	79⅞	60	88⅜	59⅞	94¼	65½	Union Carbide & Carbon	No	9,277,288	3.00	...	4.55	3.86
42¼	52	35	65⅝	42½	69½	52	United Carbon	No	397,885	3.00	...	3.36	3.81
32	34¼	20	28	14	29¾	13½	U. S. Indus. Alcohol	No	391,238	1.00	...	2.73	1.06
18⅝	34⅛	15½	43⅞	25	40	16	Vanadium Corp. Amer.	No	425,708	1.50	...	2.85	3.25
23¾	27¼	20	31½	14	33¾	17	Victor Chem.	5	696,000	1.40	...	1.45	1.59
1½	2½	¾	4⅛	1¾	5¾	2½	Virginia-Caro. Chem.	No	486,122	...	...	—1.36	—1.57
27	29½	18⅞	31¾	14	33¾	17	6% cum. part. pfd.	100	213,052	1.00	...	2.89	2.41
31⅜	36½	27¼	38½	27¾	39¼	15¼	Westvaco Chlorine	No	353,152	1.85	...	2.96	2.91
106	112	105	109⅞	108	...	...	cum. pfd.	No	59,885	4.50	...	21.98	...
NEW YORK STOCK EXCHANGE													
36¼	42⅜	31	39⅞	26	35¾	18⅜	Amer. Cyanamid "B"	10	2,618,387	0.60	...	2.44	2.07
7	7¾	6⅜	8⅛	5	9¼	5	Duval Texas Sulphur	No	500,000	1.25	...	1.16	1.25
85½	99	65	92	60	68	30	Heyden Chem. Corp.	100	125,497	3.00	...	6.26	5.98
62	96¼	55	104	65	117	90	Pittsburgh Plate Glass	25	2,188,040	5.00	...	6.30	4.94
70	84	61	100	62½	113½	81	Sherwin Williams	25	638,927	3.00	...	6.57	5.96
111	115½	108½	114¾	106	116	106½	5% cum. pfd.	50	122,289	5.00	...	39.49	35.08
PHILADELPHIA STOCK EXCHANGE													
175½	185	162	192	158¾	179	135	Pennsylvania Salt	50	150,000	8.00	...	...	10.52

PRICE RANGE 1941/2 January Last	1941/2 High	1941/2 Low	1940 High	1940 Low	1939 High	1939 Low	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE											
102⅛	104½	100¾	105¼	100⅛	103¾	98	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
37	42¼	26⅛	41	27½	41½	19	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
36	40	25⅜	39¾	27	37	21¼	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
97⅞	99⅞	94¾	100¼	93½	95¾	88¾	Shell Union Oil	1954	2½	J-J	85,000,000
104⅝	106⅝	102½	107	101⅛	106¼	97⅞	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
104½	150⅝	103	107	100⅝	106⅛	94¼	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
105¼	107⅝	102⅞	108¼	102	105⅞	95¼	Texas Corp.	1959	3	A-O	40,000,000

* Including extras paid in cash.
** For either fiscal or calendar year.

New Trade Marks of the Month

Gasketite
393,001

SEARLE
393,021

424,862

All-Klimate
433,043

LUCORTEUM
437,484

LA SYLPHIDE
438,132

AQUAPEL
438,188

OSMI-TUNGSTEN
438,228

ROTOSOL
439,917

Secure
439,977

FIRE CHIEF SOOT DESTROYER BRICK
442,596

HYFAC
443,487

KONTAKT
443,488

SANITONE D
443,495

SANITONE S
443,496

SANITONE X
443,497

C F D
444,256

SAV-A-SIZE
444,748

PLASTIC ROPE
444,912

Q. B. OITICICA
445,783

GUILD
445,979

EN-TOUT-CAS
446,022

TWELVE TRIBE
446,237

446,740

ALFESIL
446,934

JEMMIX
447,084

WETSO
447,221

V
447,333

PRIMONOL
447,382

Cel-O-Pak
447,540

ZYRONE

NO-INFERNO
447,584

ZINBORSAL
447,767

VITOL
447,860

SILV·ALL
447,987

Cam-Ray
448,053

THOR-CLENE
448,087

A.A.WESTCOAST
448,107

RED ★ STAR
448,108

XX SUPERIOR
448,109

XXX SUPERIOR
448,110

AUNT DINAH
448,128

Trade Mark Descriptions †

393,001. Miller Manufacturing Co., Camden, N. J.; Nov. 20, '40; for adhesives; since 1934.

393,021. G. D. Searle & Co., Chicago, Ill.; Nov. 18, '41; for medicinal and pharmaceutical preparations.

393,334. William R. Warner & Co., Inc., New York, N. Y.; Dec. 6, '40; for elixir of vitamin B complex; since Nov. 28, '40.

393,343. Air-conditioned Fabrics Corp.; New York, N. Y.; Sept. 3, '41; for chemicals used for processing, finishing, or coating textile fabrics, paper, leather, metal and plastics, since Jan. 10, '39.

424,862. Bear Drug Co., Shawnee, Okla.; Oct. 25, '39; for prescriptions and pharmaceuticals; since Aug. 30, '35.

433,043. Hygrade Products Company, Inc.; Long Island City, N. Y.; June, 13, '40; for hydraulic shock absorber compound; since May 1, '40.

437,484. Sharp & Dohme, Inc., Philadelphia, Pa.; Nov. 1, '40; for preparations used as biological stimulants; since Oct. 30, '40.

438,132. Sidney Henry, New York, N. Y. Nov. 22, '40; for perfumes, toilet water, cologne, brilliantines, hair preparations, face powders, lipsticks, nail preparations; since Nov. 15, '40.

438,188. American Bitumuls Company, Wilmington, Del.; Nov. 25, '40; for asphalt, asphalt emulsions, asphalt compositions; since Nov. 4, '40.

438,228. The H. A. Wilson Co., Newark, N. J.; Nov. 25, '40; for electrical contacts; since May 14, '40.

439,917. American Mineral Spirits Company, Chicago, Ill.; Jan. 24, '41; for mixture of low boiling liquid hydrocarbons suitable for use in rotogravure inks; since Jan. 7, '41.

439,977. Select Cosmetics Co., Chicago, Ill.; Jan. 25, '41; for body deodorant; since Nov. 8, '39.

442,596. Harold J. Knack, Detroit, Mich.; April 15, '41; for soot destroyer bricks; since July 1, '38.

443,487. Emery Industries, Inc., Cincinnati, O.; May 12, '41; for hydrogenated marine oil fatty acids; since '40.

443,488. Emery Industries, Inc.; Cincinnati, O.; May 12, '41; for fat splitting reagents and saponifiers; since '15.

443,495. Emery Industries, Inc., Cincinnati, O.; May 12, '41; for absorbefacient and detergent for dry cleaning; since '33.

443,496. Emery Industries, Inc., Cincinnati, O.; May 12, '41; for absorbefacient and detergent used in dry cleaning, hand spotting and for general cleaning purposes; since '37.

443,497. Emery Industries, Inc., Cincinnati, O.; May 12, '41; for absorbefacient for dry cleaning; since '34.

444,256. Co-operative Feed Dealers, Inc.; Binghamton, N. Y.; June 6, '41; for wheat germ oils to be mixed with animal foods; since Feb. 11, '41.

444,748. Harry Blamey (Blamey Decorating Co.) Sacramento, Calif.; June 23,'41; for adhesive paste; since June 1, '41.

444,912. Plastic Products Company, Detroit, Mich.; June 27, '41; for joint sealing materials; since June 10, '41.

445,783. The Scientific Oil Compounding Co., Chicago, Ill.; July 30, '41; for compound or composition of bodied oiticica oil for use in paints and varnishes; since Oct. 16, '39.

445,979. Drug Guild, Inc., New York, N. Y.; Aug. 5, '41; for drugs and pharmaceuticals; since Oct. '37.

446,022. The En-Tout-Cas Company, Ltd.; Leicester, Eng.; Aug. 6, '41; for burnt clay used in the construction of tennis courts; since '16.

446,237. James E. McMullin & Sons, Sparta, Ga.; Aug. 14, '41; for blood tonic; since Mar. 6, '40.

446,740. Magnaflux Corp., Chicago, Ill.; Sept. 2, '41; for metallic comminuted paramagnetic materials; since Oct. 7, '40.

446,934. Louis S. Wertz Mfg. Co., Cleveland, O.; Sept. 9, '41; for finely divided material for incorporation in hydraulic cements; since May 5, '41.

447,084. The Union Mining Co., Mount Savage, Md. and Pittsburgh, Pa.; Sept. 16, '41; for ceramic materials to be used as a monolith lining for ladles, cupolas, brick setting, crucibles and well; since Nov. 7, '40.

447,221. West Virginia Pulp & Paper Co., New York, N. Y.; Sept. 20, '41; for crude tall oil (talloel) soap derived from the fats and resins of pine wood; since Mar. 8, '39.

447,333. The Hooven & Allison Co., Xenia, O.; Sept. 26, '41; for rope composed of manila and other fibres and binder twine; since Sept. 9, '41.

447,382. United Varnish Corp., Long Island City, N. Y.; Sept. 27, '41; for alkali resistant pigmented coating for use on new plaster as a paint sealer; since July 1, '41.

447,540. Florida Wholesale Florists, Inc., Orlando, Fla.; Oct. 4, '41; for natural plumosus; since June 3, '41.

447,556. The Chattanooga Medicine Co., Chattanooga, Tenn.; Oct. 6, '41; for iron vitamin tonic; since Sept. 16, '41.

447,584. Zeph S. Chapman, Los Angeles, Calif.; Oct. 6, '41; for preparation of chemicals used for the extinguishment of magnesium fires; since May 7, '41.

447,767. Rigidtest Products, Inc., Chicago, Ill.; Oct. 13, '41; for antiseptic and bactericidal preparations; since June 1, '40.

447,860. Automotive Economy Corp.; Wilmington, Del., and New York, N. Y.; Oct. 17, '41; for energizing preparations or chemicals to be added to fuels; since Sept. 15, '38.

447,987. John C. Stalfort & Sons, Inc., Baltimore, Md.; Oct. 21, '41; for silver polish; since Jan. '35.

448,053. The Kearns Coal Co., Cincinnati, O.; Oct. 23, '41; for coal; since Aug. 30, '39.

448,087. Thornton Laundry & Dry Cleaning Co., Youngstown, O.; Oct. 24, '41; for dry cleaning preparation; since May 15, '40.

448,107. McHutchinson & Co., New York, N. Y.; Oct. 25, '41; for raffia; since Sept. '11.

448,108. McHutchinson & Co., New York, N. Y.; Oct. 25, '41; for raffia; since Sept. '11.

448,109. McHutchinson & Co., New York, N. Y.; Oct. 25, '41; for raffia; since July, '28.

448,110. McHutchinson & Co., New York, N. Y.; Oct. 25, '41; for raffia; since July '28.

448,128. The Auto Supplies Mfg. Co., Inc., Denver, Colo.; Oct. 27, '41; for chemically treated polishing cloths; since Oct. '36.

† Trademarks reproduced and described include those appearing in the *Official Gazette* of the *U. S. Patent Office*, Jan. 13 to Feb. 3, 1942.

New Trade Marks of the Month

YU-KA STARCH CORP
448,179

AIRLOK
448,229

METEX
448,254

Orange POKE ROOT and SALT PETRE COMPOUND
448,285

LARUTAN
Read it Backwards
448,291

VITA SOLV
448,310

ALBREX
448,479

IMPREX
448,481

KALREX
448,482

CAROTEX-42
448,484

FUZEE
448,593

VITADIET
448,623

CHARLAB
448,672

PHENOBOLE
448,687

Koratón
448,697

GOLD NUGGET ANTHRACITE

You'll Know It By The Gold Nuggets
HARRY E. COAL CO.
448,721

MAR-BEL
448,756

CALFATE
448,785

Dovasac
448,792

LUMA-SCREEN
448,817

DIGIFOLIN
448,819

PAN-CONCEMIN
448,831

FERRINESTA
448,832

SYLPLAST
448,841

NATIONAL
EN-AR-CO SOLV
448,870

INDECISION
448,900

GONG
448,906

Mix-ol-ag
448,921

GOOD MORNING
448,979

PHOSCAVITA
448,994

VICAPHOS
448,995

RAVEN
449,011

RAVEN
449,012

FK
449,025

COSMASUL
449,040

DUOSULFON
449,047

BLACKHIDE
449,100

HI-HIDE
449,101

DOMESTRIN
449,105

RETINAVITE
449,106

EJEXOOT
449,146

ALKAID
449,913

RAVEN
449,292

448,179. Yu-Ka Starch Corp., Miami Beach, Fla.; Oct. 27, '41; for laundry starch and starch used as a sizing; since Sept. 10, '41.

448,229. Plastergon Wall Board Co., Buffalo, N. Y.; Oct. 29, '41; for mineral wool insulation; since April 28, '41.

448,254. Joseph M. Gordon, New York, N. Y.; Oct. 30, '40; for plastic composition in sheet form; since July 25, '41.

448,285. Dairy Association Company, Inc., Lyndonville, Vt.; Oct. 31, '41; for composition of poke root and salt petre for use in the treatment of non-contagious garget in dairy cows; since Nov. 15, '35.

448,291. Healthaids, Inc. of New Jersey, Newark, N. J.; Oct. 31, '41; for vitamin preparation for use as a food auxiliary and vitamin deficiency corrective; since Oct. 23, '41.

448,310. The White & Bagley Co., Worcester, Mass.; Oct. 31, '41; for liquid flushing and cleaning; since Mar. 16, '38.

448,479. Socony-Vacuum Oil Company, Inc., New York, N. Y.; Nov. 8, '41; for lubricating greases; since Jan. 1, '31.

448,481. Socony-Vacuum Oil Company, Inc., New York, N. Y.; Nov. 8, '41; for insulating oil for electric cables; since Sept. 1, '31.

448,482. Socony-Vacuum Oil Company, Inc., New York, N. Y.; Nov. 8, '41; for lubricating greases; since Jan. 1, '31.

448,484. Southeastern Clay Co., Aiken, S. C.; Nov. 8, '41; for refined kaolin; since Oct. 4, '41.

448,593. Turco Products, Inc., Los Angeles, Calif.; Nov. 12, '41; for cleaning compound intended primarily for the cleaning of metal surfaces; since Nov. 12, '40.

448,623. Scientific Nutrition Corp., Bloomfield, N. J.; Nov. 13, '41; for food supplements containing various vitamins and minerals; since Oct. 30, '41.

448,672. Charlotte Chemical Labs, Inc., Charlotte, N. C.; Nov. 15, '41; for washing powder; since May 2, '38.

448,687. American Chemical Company, Inc., Chicago, Ill; Nov. 17, '41; for synthetic organic chemical used as an antiseptic or vermifuge and urinary antiseptic for animals and poultry consisting of phenothiazine and excipient; since Nov. '40.

448,697. The Knox Company, Los Angeles, Calif.; for medicinal preparations to stimulate the circulatory system of the human body; since May 15, '41.

448,721. The Harry E. Coal Co., Swoyerville, Pa.; Nov. 18, '41; for coal; since April 10, '34.

448,756. Cosmata, Inc., Long Island City, N. Y.; Nov. 19, '41; for soaps; since Sept. 16, '41.

448,785. General Chemical Company, New York, N. Y.; Nov. 21, '41; for calcium sulfate for use as a pigment extender and other purposes; since Oct. 17, '41.

448,792. Charles C. Haskell & Co., Inc., Richmond, Va.; Nov. 21, '41; for analgesic sedative tablets; since Mar. 1, '41.

448,817. Celluloid Corporation, Newark, N. J.; to Celanese Corp. of America, New York, N. Y.; Nov. 22, '41; for plastic sheets suitable for transmitting and/or diffusing light; since Oct. 14, '41.

448,819. Ciba Pharmaceutical Products, Inc., Summit, N. J.; Nov. 22, '41; for preparation used in heart affections; since Aug. 1, '41.

448,831. The Wm. S. Merrell Company, Cincinnati, O.; Nov. 22, '41; for polyvitamin tablets; since Oct. 28, '41.

448,832. The Wm. Merrell Co., Cincinnati, O.; Nov. 22, '41; for acid neutralizing astringent and hematinic; since Oct. 28, '41.

448,841. Sylvania Industrial Corp., Fredericksburg, Va.; Nov. 22, '41; for plasticizers; since Sept. 12, '41.

448,870. The National Refining Co., Cleveland, O.; Nov. 24, '41; for flushing oil; since May '41.

448,900. Bush Aromatics, Inc., New York, N. Y.; Nov. 25, '41; for perfumes, and natural and synthetic essential oils suitable for perfuming purposes; since April 1, '41.

448,906. Sidney Henry (S. H. Hirsch) New York, N. Y.; Nov. 25, '41; for perfume and toilet water, face powder and lipstick since Nov. 17, '41.

448,921. Park Drug Co., Inc., New York, N. Y.; Nov. 25, '41; for preparation for relief of occasional constipation; since Nov. 17, '41.

448,979. Mykron Company, Chicago, Ill.; Nov. 27, '41; for vitamin preparations; since Mar. 15, '41.

448,994. William R. Warner & Co., Inc., New York, N. Y.; Nov. 27, '41; for calcium diphosphate preparation containing vitamins, intended for use in nutritional disturbances; since Nov. 18, '41.

448,995. William R. Warner & Co., Inc., New York, N. Y.; Nov. 27, '41; for calcium diphosphate preparation containing vitamins, intended for use in nutritional disturbances; since Nov. 18, '41.

449,011. The L. Martin Company, Inc., New York, N.Y.; Nov. 28, '41; for lampblack for use as an ink pigment; since 1882.

449,012. The L. Martin Company, Inc., New York, N. Y.; Nov. 28, '41; for lampblack for use as a paint pigment; since 1882.

449,013. The L. Martin Company, Inc., New York, N. Y.; Nov. 28, '41; for lampblack having a general use in the industrial arts; since 1882.

449,025. Sociedad Anonima De Productos Quimicos Fk para Industria y Farmacia, New York, N. Y.; Nov. 28, '41; for nicotinamide, nicotinic acid diethylamide, acetyl-P-aminophenyl salicylate, digatalin; since Oct. 15, '41.

449,040. Cosmata, Inc., Long Island City, N. Y.; Nov. 29, '41; for soap; since Oct. 21, '41.

449,047. Charles C. Haskell & Co., Inc.; Richmond, Va.; Nov. 29, '41; for ointment for the treatment of cutaneous infections; since May 15, '41.

449,100. Pittsburgh Plate Glass Company, Pittsburgh, Pa.; Dec. 2, '41; for liquid and paste paints, paint primers, paint enamels and lacquers, and varnishes; since Mar. 19, '41.

449,101. Pittsburgh Plate Glass Company, Pittsburgh Pa.; Dec. 2, '41; for liquid and paste paints, paint primers, paint enamels and lacquers, and varnishes; since Oct. 29, '41.

449,105. Sharp & Dohme, Inc., Philadelphia, Pa.; Dec. 2, '41; for substances causing cellular stimulation, hormones and preparations containing hormones; since Nov. 6, '41.

449,106. Sharp & Dohme, Inc., Philadelphia, Pa.; Dec. 2. '41; for preparations for treatment of conditions resulting from metabolic deficiencies; since Nov. 26, '41.

449,146. Makron Chemical Co., New York, N. Y.; Dec. 3, '41; for soot remover; since Nov. 5, '41.

449,292. Pine Bros., Inc., Philadelphia, Pa.; Dec. 8, '41; for ant-acid preparation; since Oct. 31, '41.

A Complete Check—List of Products, Chemicals, Process Industries

Resin, Plastics*

Carbohydrate ether xanthates and process of producing same. No. 2,265,914. Leon Lilienfeld to Lilienfeld Patents Inc.

Process making a shaped artificial product from a solution which contains a dissolved xanthate of an alkali-soluble cellulose ether other than a hydroxy-alkyl cellulose ether, which comprises the step of coagulating the said material by contacting said solution while formed into the shape of the desired artificial product with a precipitating agent. No. 2,265,915. Leon Lilienfeld to Lilienfeld Patents, Inc.

Manufacture of shaped structures and other useful articles from cellulose derivatives. No. 2,265,916. Leon Lilienfeld to Lilienfeld Patents, Inc.

Process removing taste and odor from polymeric n-butyl methacrylate. No. 2,265,937. Harry R. Dittmar to E. I. du Pont de Nemours & Co.

Method saponifying resin acids with alkaline solutions while avoiding gel formation which comprises heating said acids to temperatures above the melting point thereof, slowly adding thereto an aqueous solution of a saponifying alkali while evaporating water from the reaction mixture at a rate not less than the combined rate of water addition and water formation in the mixture. No. 2,265,941. George H. Foster to American Cyanamid Co.

Process comprising condensing a member of the group consisting of an urea, a thio-urea, an urethane, biuret, a guanidine, melamine, cyanuric acid and a member of the group consisting of lignin-sulfonic acid, its alkali metal and alkaline earth metal salts purified by way of the basic calcium salt of lignin-sulfonic acid with an aldehyde selected from the class consisting of formaldehyde and furfural. No. 2,266,265. Alfred Rieche, Walter Rudolph, Richard Klar to I. G. Farbenindustrie Aktiengesellschaft.

Rosin modified by a phenol-ketone formaldehyde resin. No. 2,266,568. Israel Rosenblum.

Color stable resin containing indene polymers. No. 2,266,675. William H. Carmody to The Neville Co.

Molded thermoplastic articles. Method and apparatus for improving. No. 2,266,831. John B. Tegarty to The Standard Products Co.

Process producing a pressed fibrous resin impregnated body. No. 2,267,316. Wesley R. Thompson and William E. Flood to Catalin Corp.

Resinous compositions and laminated articles produced therewith. No. 2,267,390. George Alexander to General Electric Co.

Heat-stable resin composition including polymerized vinyl halide, said composition containing intimately dispersed therein a stabilizing material comprising an organo-metallic compound in which the inorganic constituent is of the group consisting of lead and tin radicals in combination with oxygen and hydroxyl radicals. No. 2,267,777. Victor Ungve to Carbide & Carbon Chemicals Corp.

Heat-stable vinyl resin composition including polymerized vinyl halide containing intimately dispersed therein a stabilizing material comprising an organo-metallic lead salt of a fatty acid containing more than eight carbon atoms. No. 2,267,778. Victor Ungve to Carbide & Carbon Chemicals Corp.

Heat-stable resinous composition comprising a vinyl resin containing polymerized vinyl halide and a stabilizing material, said stabilizing material comprising an organo-metallic tetra-alkyl derivative of tin. No. 2,267,779. Victor Ungve to Carbide & Carbon Chemicals Corp.

Resin composition comprising the heat reaction product of a plurality of furane units consisting of furfuraldehyde and furfuralcohol and vinyl units consisting of vinyl chloride and vinyl acetate, the ratio of said aldehyde to said alcohol being 1:1 to 3:1 and the proportion of said vinyl units to said furane units being 3 to 15% of said furane units. No. 2,267,830. Harry F. Lewis to The Institute of Paper Chemistry.

Method preparing synthetic resins that comprises heating dichloro ethyl ether in the presence of water with a benzene-m-disulfinate of an alkali metal. No. 2,268,062. John K. Simons to Plaskon Company, Inc.

Condensation products and process of preparing them. No. 2,268,126. Ludwig Orthner and Heinz Sonke to I. G. Farben Lynch Corp.

Resinous composition. No. 2,268,173. Ben E. Sorenson to E. I. du Pont de Nemours & Co.

Completely homogeneous, heat and light stable product resulting from co-polymerization of an approximately equimolar mixture of polymer-free monomeric methyl alpha-chloroacrylate and polymer-free monomeric styrene. No. 2,268,177. Harold W. Arnold to E. I. du Pont de Nemours & Co.

Rubber*

Method of imparting to rubber at least some of the physical properties of a vulcanized rubber which comprises heating an aqueous dispersion of the rubber in the substantial absence of oxygen with a material selected from the class consisting of potassium ferricyanide, ferric chloride and mercuric chloride. No. 2,265,324. David Spence to The B. F. Goodrich Co.

A new composition of matter comprising an external phase consisting of balata and an internal phase distributed therethrough consisting of discrete particles of a vulcanized golf rubber powder directly derived from latex substantially all of which powder will pass through a 50 mesh screen and most of which will pass through a 100 mesh screen. No. 2,265,776. James A. Merrill to Wingfoot Corp.

Method dispersing rubber in a rubber non-solvent normally having a coagulative effect on natural rubber latex and miscible with water which comprises flocculating natural rubber latex by the addition thereto of an acidic salt and progressively replacing the latex serum with the non-solvent. No. 2,265,777. James A. Merrill to Wingfoot Corp.

Rubber hydrochloride. Apparatus for producing. No. 2,266,044. Henry F. Irving and Floyd E. Williams to Marbon Corp.

In method applying an aqueous rubber to a base, the steps which consist in subjecting the base to a solution containing a tetra-borate, then applying an aqueous rubber composition containing a vegetable gum gellifiable by the borate, drying and vulcanizing the resulting product. No. 2,266,203. Glen S. Hiers to Collins & Aikman Corp.

Process inhibiting the deterioration of rubber including increasing its resistance to flex-cracking which comprises treating the same with a mono-N-methyl diaryl-arylene diamine. No. 2,266,576. William F. Tuley and Phillip T. Paul to United States Rubber Co.

Process preserving organic substances which tend to deteriorate by absorption of oxygen from the air which comprises incorporating therewith an anti-oxidant which is a carbamyl-amino diarylamine having the carbamyl group directly attached to the primary amino nitrogen atom of the amino diarylamine. No. 2,266,601. Louis H. Howland to United States Rubber Co.

Process of preserving organic substances which tend to deteriorate by absorption of oxygen from the air which comprises incorporating therein an anti-oxidant having the general formula

$$R_1\text{-}\overset{H}{N}\text{-}R_2\text{-}\overset{H}{N}\text{-alkylene-CO-}Y'$$

where R_1 is an aryl group; R_2 is an arylene group; and Y' is a member selected from the group consisting of an amino, -O-metal, -O-ammonium, hydroxy, alkoxy and an aryloxy group. No. 2,266,602. Louis H. Howland to United States Rubber Co.

Process of preserving organic substances which tend to deteriorate by absorption of oxygen from the air which comprises incorporating therewith an anti-oxidant which is an N-carbalkoxy-para-amino-diarylamine. No. 2,266,603. Louis H. Howland to United States Rubber Co.

Rubberlike interpolymers of butadiene hydrocarbons and fumaric acid esters and process of producing the same. No. 2,266,794. Wilhelm Pannwitz, Bernhard Ritzenthaler, Heinrich Hopff and Gustav Steinbrunn to I. G. Farbenindustrie Aktiengesellschaft.

Process producing vulcanized rubber products which comprises vulcanizing rubber in the presence of an accelerator embodying a 5-membered heterocyclic nucleus embodying 4 directory connected ring carbon atoms and a ring nitrogen atom, the carbon atom in the 2-position directly adjajcent the ring nitrogen atom being directly linked exteriorly of the nucleus to a sulfur atom. No. 2,268,398. Louis H. Howland to United States Rubber Co.

Rubber composition containing a product of reaction of a dialkyl ketone with an N-alkyl diarylamine. No. 2,268,418. Philip T. Paul to United States Rubber Co.

Process preserving organic substances which tend to deteriorate by absorption of oxygen from the air which comprises incorporating therein a 1-nitroso-2, 2, 4-trialkyl-1, 2-dihydro quinoline. No. 2,268,419. Philip T. Paul to United States Rubber Co.

Vulcanizing rubber containing a sulfur-bearing accelerator and the product produced by heating to fusion a diaryl guanidine and a diterpenemaleic anhydride addition product. No. 2,268,501. Theodore F. Bradley to American Cyanamid & Chem. Co.

Method treating rubber which comprises vulcanizing a vulcanizable rubber mix containing a sulfur-bearing accelerator and the product produced by heating to fusion a diaryl guanidine and a monoterpene-maleic anhydride addition product acid. No. 2,268,524. Arnold R. Davis to American Cyanamid Co.

Textiles*

Artificial fibers. Method and apparatus for producing. No. 2,265,742. Charles L. Norton.

Process for improving textile yarns and fabrics rendering them soft and smooth. No. 2,266,136. Mark Weisberg and Louis Corman to Alrose Chem. Co.

Process for the treatment of threads which have been formed by the extrusion of a solution of casein into a coagulant and have been thereafter treated with a hardening agent. No. 2,266,672. Robert L. Wormell to Courtaulds, Ltd.

Substantially permanently stiffened, laundering-resistant laminated cloth article of the character of shirt collars, shirt cuffs, dress shirt bosoms and the like which are designed for wearing apparel and require laundering after use, comprising a plurality of layers of launderable cloth fabric adhesively united by means of a thermoplastic, non-bleeding bonding composition in a quantity giving substantial stiffness and resilience to the laminated article, said bonding composition including ethyl cellulose of the type soluble in organic solvents and a water-insoluble waxy material, the waxy material being present in amount within the range of about 5% to about 35% by weight of the composition. No. 2,266,940. Waldorf S. Traylor to Hercules Powder Co.

Regenerated cellulose yarn. Production thereof. No. 2,267,055. Emerson A. Tippetts to E. I. du Pont de Nemours & Co.

Process improving fastness of starch sizing upon textile material. No. 2,267,265. Louis H. Bock and Alva L. Houk to Rohm & Haas Co.

Process overcoming or preventing development of odor in textile fabrics carrying a finished resin of the urea-formaldehyde type which comprises treating the resin-carrying fabric with an aqueous solution having a pH between 7 and about 11 and containing a small amount of a water-soluble peroxide-type oxidizing agent. No. 2,267,276. Onslow B. Hager to Rohm & Haas Co.

Method insolubilizing a water-soluble, polysaccharidic sizing material having free hydroxyl groups. No. 2,267,277. Alva L. Houk and Louis H. Bock to Rohm & Haas Co.

Textile printing paste comprising an emulsion the outer phase of which comprises a water immiscible solution of a film-forming solute in a volatile organic solvent, and the inner phase of which is an aqueous solution of a textile dye discharge agents. No. 2,267,620. Norman S. Cassel to Interchemical Corp.

Process for preparing wool for removal therefrom of carbonized material. No. 2,267,694. Frank L. Evoy to Martin Evoy.

Method treating textile goods with an alkaline solution. No. 2,276,718. Donald J. Campbell & Francis L. Fennell to E. I. du Pont de Nemours & Co.

Ink for textile marking. No. 2,267,758. Francis M. Sell to The National Marking Machine Co.

Process of dyeing fibrous material. No. 2,267,770. William H. von Glahn to General Aniline & Film Corp.

Process producing artificial fibers and foils with an increased capacity of being dyed by acid dyestuffs. No. 2,267,842. Paul Schlack to Walther H. Duisberg.

Method preparing a dry, supple coated fabric having the suppleness of an uncoated fabric which comprises coating a cotton sheeting

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weighing about 1 pound per 7 yards of 40" material applying a plurality of coats of a composition comprising a vinyl alcohol butyraldehyde resin sebacic ester of monobutyl ether of ethylene glycol in amount between 30% and 65% of said resin and a wax in amount between about 8 and 18% of said resin until two ounces per yard of non-volatile components have been applied, and thereafter allowing the solvents to evaporate. No. 2,268,121. William P. Kingsley to E. I. du Pont de Nemours & Co.

Process finishing and softening textile materials. No. 2,268,273. Benjamin G. Wilkes and Alexander L. Wilson to Carbide & Carbon Chemicals Corp.

** Continued from last month (Vol. 533, Nos. 2, 3, 4, 5).*

Cellulose

Process reacting a partially substituted, anhydrous cellulose with a substance selected from the group consisting of alkali metals and alkali metal amides in a medium comprising anhydrous, liquid ammonia and a liquid anhydrous hydrocarbon, said hydrocarbon being substantially inert to said cellulose, said ammonia and said substance. No. 2,268,564. Rudolph S. Bley to North American Rayon Corp.

Process of adhering two plies of moistureproof, non-fibrous cellulosic sheet, said sheet having a moisture-proofing coating comprising essentially resin, wax and cellulose derivative material, which comprises applying polymerizable methoxyethyl methacrylate to a ply, joining the plies at the place treated with methacrylate, and thereafter polymerizing said methacrylate while it joins the two plies. No. 2,268,611. James A. Mitchell to E. I. du Pont de Nemours & Co.

Process for the production of films, foils and like products by evaporating a volatile solvent from a layer of film-forming dope on a traveling support wherein a coloring agent or other desired constituent of the product is introduced by applying a solution of said constituent free from film-forming substances to the partly dried layer of dope from supplying means kept out of contact with the surface of said partly dried layer. No. 2,268,622. James H. Rooney and Philip R. Hawtin and Stephen R. Chaplin to Celanese Corp. of America.

Treatment of yarns, foils and similar articles made of cellulosic material which comprises esterifying them in a medium which is a nonsolvent for the articles and which comprises the anhydride of a polycarboxylic acid and a compound having the formula $CXCl_2$, where X represents an atom selected from the group consisting of oxygen and sulfur. No. 2,268,649. Henry Dreyfus.

Process for softening shaped products of artificial cellulosic materials selected from the group consisting of regenerated cellulose, cellulose esters and cellulose ethers which consists in impregnating the shaped products with potassium formate. No. 2,268,832. Walter Konig to Rudolph Koepp & Co.

Process for production of cellulose meal which includes the preparatory step of treating cellulose with approximately 1 to 6% acid for 1 to 60 minutes, in particular mineral acid, until the treated cellulose can in its wet swollen condition be ground until it loses its fibrous structure and terminating such treatment while the cellulose is still in a condition in which dry grinding yields a meal which consists mainly of fragments of fibre. No. 2,269,665. Walter Herbst.

Method comprises dissolving in a water solution of a water-soluble cellulose ether from about 10 to about 25% based on the weight of said ether of a water-soluble polyhydric alcohol modified urea-formaldehyde condensate drying the mixture to remove water and heating the mixed solids to a temperature between about 90° and 170° C. for a period within the range from 150 to about 10 minutes sufficient substantially to insolubilize the dried cellulose ether. No. 2,270,180. Shailer L. Bass & Richard M. Upright to The Dow Chemical Co.

Method which comprises dissolving in a water solution of a water-solution cellulose ether a water-soluble polycarboxylic acid capable of reacting therewith at elevated temperatures to insolubilize the cellulose ether in amount from ¼ to 1 equivalent weight of the acid for each C unit of the cellulose ether, drying the mixture to remove water and heating to a temperature between about 120° C. and about 180° C. for a period varying correspondingly from about 120 to about 20 minutes sufficient substantially to insolubilize the dried cellulose ether. No. 2,270,200. Richard M. Upright to The Dow Chemical Co.

Process for improving materials containing cellulose which comprises treating the materials with a hydroxyaryl carboxylic acid methylolamide heating the thus treated materials and further treating them with a diazonium compound capable of coupling with the hydroxyaryl carboxylic acid methylolamide. No. 2,270,520. Charles Graenacher and Richard Sallfir to Society of Chemical Industry in Basle.

Method for recovery of pieces of lumps of solid precipitated cellulose organic ester from a precipitation vessel in which they are associated with a relatively small volume of valuable, non-solvent liquid containing a solvent and a non-solvent for the ester which comprises continuously flowing a suspension of the precipitated cellulose ester in the said liquid from the lower portion of the vessel to and between rotating crushing rolls whereby large lumps of ester in the liquid are reduced, further flowing the suspension to a separator, therein continuously straining the ester from the liquid, and continuously returning the strained liquid to the vessel to maintain the liquid therein substantially constant and sufficient to allow the precipitated ester in the vessel to be discharged with the liquid. No. 2,271,074. Rudolf Hofmann and Hans Mank to Hercules Powder Co.

Photographic film free from stripping and brittleness comprising a cellulose ester support and an emulsion layer, and between said support and said emulsion layer, a layer comprising gelatin hardened with chromic chloride. No. 2,271,228. Gale F. Nadeau and Clemens B. Stark to Eastman Kodak Co.

Ceramics, Refractories

Vitreous silica articles, method of producing. No. 2,268,589. John Allen Heany to Heany Industrial Ceramic Corp.

Method sealing a cylindrical glass body to a ceramic cover which comprises forming annular grooves lying adjacent each other and forming thin-walled annular portions there between, forming radial slots in one of said thin-walled annular portions, inserting one end of said body in one of said grooves between said thin-walled portions and sealing said body to said annular portions. No. 2,268,666. Edmund Lopp to G. Lorenz Aktiengesellschaft.

Water repellant composition comprising a major proportion by weight of set-hardened gypsum having incorporated therewith between 0.2% and 15% of a hydrophilic colloidal substance, between 0.5% and 15% of a waterproofing substance, and between 0.1% and 10% of a water soluble electrolyte. No. 2,269,457. Delber F. Jurgensen, Jr. to United States Gypsum Co.

Method of producing an improved refractory from natural chrome ore which comprises mixing with the chrome ore lime sufficient substantially only to convert free and combined silica in the mixture into dicalcium silicate and burning the mixture at a temperature in excess of 2600 F. No. 2,270,220. Norman P. Pitt, Arthur C. Halferdahl and F. E. Lathe to Canadian Refractories, Ltd.

Method of making white vitreous enamel ware with coatings less in weight than 40 grams per square foot and having a reflectance above 70 and substantially greater than that producible with the frit used and clay alone. No. 22,011. Charles Kinzie and Charles Commons, Jr. to Titanium Alloy Manufacturing Co.

Apparatus for producing ground or polished glass strip. No. 2,270,362. Frederic B. Waldron, Patrick M. Hogg and Granville H. Baillie to Pikington Brothers, Ltd.

Cutting tool consisting of a molded self-bonded sintered highly refractory aluminum oxide of high purity and a chromium oxide the body of said cutting tool having a fine crystalline structure throughout. No. 2,270,607. Eugen Ryschkewitsch to Chemical Marketing Co., Inc.

Article of vitreous quartz and process for producing and working it. No. 2,270,718. Franz Skaupy and Gustav Weissenberg.

Method tempering a glass article, which has been heated to a temperature near the softening temperature of the glass from which the article is made which includes rapidly chilling the article by passing it through a bath in which there is a temperature gradient which descends along the path of movement of the article. No. 2,271,038. William W. Shaver to Corning Glass Works.

Process for producing cement. No. 2,271,276.. Ole Rolfsen.

In batch producing ceramic bodies including mixed alumina and silica compounds and finely divided wood charcoal carbon in an amount less than one and one-half per cent. by weight and more than one-fourth of one per cent. No. 2,271,316. Harry Spurrier.

Heat cast refractory analytically containing not more than 25% magnesia, the remainder being substantially only oxide of chromium. No. 2,271,362. Theodore E. Field to Corhart Refractories Co.

Heat cast refractory consisting essentially of ferrous chromite and substantially free from compounds other than those of the metals forming said chromite. No. 2,271,363. Theodore E. Field to Corhart Refractories Co.

Heat cast refractory substantially free from silica and consisting essentially of ferrous chromite and at least one of the alkaline earth chromites. No. 2,271,364. Theodore E. Field to Corhart Refractories Co.

Cast refractory containing by chemical analysis from 15 to 30% iron oxide and not over 50% alumina, the remainder being substantially only chromic oxide, without any substantial amount of magnesia and silica. No. 2,271,365. Theodore E. Field to Corhart Refractories Co.

Cast refractory consisting essentially of crystaline zirconia and corundum in a siliceous non-crystalline matrix in which the total silica in the refractory is less than 20 per cent. by weight by chemical analysis. No. 2,271,366. Theodore E. Field to Corhart Refractories Co.

Cast refractory article containing at the most a slight amount of silica and consisting principally of zirconia, alumina and at least one of the group consisting of Na_2O and K_2O in which the zirconia is greater than 20% and the ratio of alumina to alkali is less than 19 to 1 by weight by chemical analysis. No. 2,271,367. Gordon S. Fulcher and Theodore E. Field to Corhart Refractories Co.

Heat cast refractory containing substantial quantities of crystalline of chromic oxide greatly in excess of one per cent. and zirconia. No. 2,271,368. Gordon S. Fulcher and Theodore E. Field to Corhart Refractories Co.

Cast refractory consisting essentially of zirconia and alumina and substantially free from iron oxide and titania and in which the zirconia is not less than 60% and the alumina is not greater than 25% by weight by chemical analysis. No. 2,271,369. Gordon S. Fulcher and Theodore E. Field to Corhart Refractories Co.

Tempering glass, method therefor. No. 2,271,373. Bernard Long to The American Security Co.

Chemical Specialty

Normally solid printing ink for the commercial printing of publications, containers and other literature, which melts at a temperature above 50° C. and at elevated temperatures substantially above its melting point possesses a fluid consistency suitable for such printing by means of a suitably heated printing machine, said ink comprising coloring pigment incorporated in a normally hard thermo-fluid solid being free from solvents volatile at said elevated temperatures, said solid comprising predominantly hard thermoplastic resin with most of the remainder hard waxy material. No. 2,268,593. Walter Huber to J. M. Huber, Inc.

Printing ink for book, newspaper, magazine or similar commercial printing consisting of printing ink coloring material incorporated in a solid thermo-fluid vehicle more than 50% by weight of which consists of hard thermoplastic resin and the remainder of which includes a substantial proportion of organic plasticizing material having a liquefying effect on said resin when the ink is molten, said ink being solid, rigid and smudge-resistant at ordinary temperatures, melting when heated, having a fluid consistency suitable for printing at elevated temperatures substantially above its melting temperature, and being stable against volatilization and chemical change in use at said elevated temperatures. No. 2,268,595. Walter Huber, Frank G. Breyer and Lothian M. Burgess to J. M. Huber, Inc.

Composition in cream form adapted to remove hardened liquid nail polish and method of making same. No. 2,268,642. Horace M. Carter.

Cosmetic emulsion comprising a substance selected from the class consisting of mucilaginous and oleaginous materials, a morpholine soap of a higher fatty acid and a vitamin A and D concentrate. No.

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2,268,736. Loran O. Buxton and Louis T. Rosenberg to National Oil Products Co.

Nut fiber laxative food product comprising a digestible naturally oily vegetable fiber of the hard-shell tropical nut group having a palatable flavor from which most of the natural oil has been removed and an oil having laxative properties substituted. No. 2,269,015. Jesse C. Forkner to John H. Forkner.

Method of producing acid-proof mortars which consists in mixing cement powders consisting of pulverulent aromatic sulfochlorides and acid-proof filling substances with potassium silicate and water. No. 2,269,096. Karl Dietz and Franz Privinsky to Pen-Chlor, Inc.

Antifreeze composition of matter comprising an aqueous solution of magnesium chloride and a phosphate of ammonia the quantity of magnesium chloride present being in excess of that with which the quantity of ammonium phosphate present would normally react to yield precipitated magnesium phosphate and small proportions of an inhibitor mixture comprising Acacia catechu, Ourouparia gambir, Chondrus and Tsuga canadensis. No. 2,269,138. Lionel Bernard.

An insecticide comprising essentially a combination made of a N-heterocyclic compound having only slight insecticidal effect upon the larvae of the yellow fever mosquito selected from the group consisting of pyrolle derivatives, pyridine derivatives, carbazole, quinoline, acridine, hydrogenation products of the foregoing and substitution products of the foregoing and an O-heterocyclic compound having only slight insecticidal effect upon the larvae of the yellow fever mosquito selected from the group consisting of pyrone, condensation products thereof, with aromatic nuclei and substitution products thereof, said combination being characterized by a greatly enhanced insecticidal effect on the larvae of the yellow fever mosquito as compared with that of either of said compounds. No. 2,269,272. Oswald Krefft to Chemical Marketing Co., Inc.

Process of making insecticides, fungicides and the like, which comprises treating a coal tar material produced by the low temperature carbonization of coal and containing a substantial quantity of high boiling oil of a character such that not more than 25% of the oil boils below 275° C., with an alkali-metal chloride, and separating the alkaline solution. No. 2,269,336. Caleb Davies, Jr. to Pittsburgh Coal Carbonization Co.

Herbicide including an aqueous carrier, calcium thiocyanate in an effective amount and a water-soluble salt of a disubstituted dithiophosphoric acid, the substitutent being chosen from the group consisting of alkyl, aryl and alkylaryl. No. 2,269,396. David Jayne, Jr. to American Cyanamid Co.

Vegetation killing composition including water soluble calcium thiocyanate in an effective amount. No. 2,269,397. John Osborne to American Cyanamid Co.

Abrasive article and method of making the same. No. 2,269,415. George Netherly, Gilbert Anderson, Bert Cross to Minnesota Mining & Manufacturing Co.

Coated abrasive article. No. 2,269,416. George Netherly and Bert Cross and Gilbert Anderson to Minnesota Mining & Manufacturing Co.

Fire extinguishing composition comprising a foam producing substance and a foam stabilizer, the latter comprising fatty acid soap reacted with alkali metal permanganate. No. 2,269,426. Fisher L. Boyd.

A cap having a cork composition cushion liner comprising cork granules and sulfur-vulcanized rubber, said cushion liner being substantially devoid of free sulfur. No. 2,269,440. Louis De Holczer to Crown Cork & Seal Co., Inc.

An insecticide containing as its essential active ingredient copper benzoyl lacto-arsenite. (2) A fungicide containing as its essential active ingredient copper benzoyl lacto-arsenite. No. 2,269,891. Charles Bowen and Frederick Dearborn to Henry Wallace as Secretary of Agriculture of the U. S. A.

A fungicide and insecticide containing as its essential active ingredient a heavy metal salt of the di-thiocarbamic acid of morpholine. No. 2,269,892. Roscoe Carter to Henry A. Wallace as Secretary of Agriculture of the U. S. A.

An insecticide containing as its essential active ingredient the morpholine salt of the di-thiocarbamic acid of morpholine. No. 2,269,-893. Roscoe Carter to Henry Wallace as Secretary of Agriculture of the U. S. A.

Fire extinguishing composition. No. 2,269,958. George Urquhart to National Foam System, Inc.

Method of initiating root formation and growth in plant stem cuttings which comprises causing to adhere to the basal end of cut stem portions of plants dust containing 200 to 5000 parts per million of synthetic organic plant hormone chemical, less than 100 but not less than 2 parts per million of organic mercurial disinfectant and substantially 0.1 to 5% of plant nutrient material and planting the so-treated cutting. No. 2,270,046. Nathaniel H. Grace to The Honorary Advisory Council for Scientific & Industrial Res.

Improvement in manufacture of an asbestos cement building board which comprises impregnating an asbestos cement board with a liquid saturant having a Saybolt universal viscosity varying from 85 to 105 seconds at 140° F., and A. P. I. gravity of 16.9° to 22.9° and consisting of 35 to 40% of an asphalt having a melting point of 140 to 185° F. and 65 to 60% of a solvent naphtha having an A. P. I. gravity of 28 to 48° and a kauri butanol solvent power of at least 53. No. 2,270,047. Henry S. Goodwin and Herman D. Winters, Jr. to Standard Oil Development Co.

A lubricating composition comprising glycerine, a small amount of sodium hydroxide and a small amount of sodium secondary-alcohol sulphate. No. 2,270,101. Herman E. Ballard.

Lubricating composition for metal parts exposed to water solutions of strong alkalies consisting of a hydro-carbon oil base and small amounts of oleic acid and dehydrated calcium chloride. No. 2,270,-102. Herman E. Ballard.

Method of improving the melting point-penetration characteristics and translucency of low grade petrolatums which comprises treating said petrolatums in propane solution with sulfuric acid at a temperature of the order of 70° to 85° F. No. 2,270,214. Chester E. Adams, Arthur B. Brown and David W. Bransky to Standard Oil Development Co.

In hydroculture of plants a nutrient composition comprising a mixture of water-soluble plant-nutrient salts and a water-soluble gum precipitant-forming inhibitor essentially free of albuminous bodies the proportion of said inhibitor being 7 to 8% of said composition and being sufficient to prevent substantial formation of insoluble material when said composition is dissolved in water. No. 2,270,-518. Carleton Ellis to Ellis Laboratories, Inc.

Powdered soup composition which on the addition of water becomes dispersed to form a broth, said composition having a basic soup-forming ingredient of mono-sodium glutamate a thickening agent in proportion to the thickness desired in the broth and a flavoring ingredient. No. 2,270,582. Gustavus J. Esselen.

In process making lithographic plates etching the developed plate with a saturated solution of magnesium chloride containing two to five per cent. by weight each of formic and glycolic acid. No. 2,270,712. William H. Wood to Harris-Seybold-Potter Co.

Composition of matter suitable for use as an adhesive cement comprising a solution of rubber in a volatile solvent said rubber having incorporated therein from about 3 to about 10% by weight of a water swollen powdered colloidal material whereby to render the composition sprayable without cobwebbing. No. 2,270,731. Edwin O. Groskopf to the Patent and Licensing Corp.

Process subjecting bonded asbestos insulating materials to the action of a reducing atmosphere at a temperature between 350° and 600° C. No. 2,270,747. Nicholas F. Arone to General Electric Co.

Foundry mold and core wash composition essentially comprising a finely-divided refractory material a finely-divided substantially gasoline-insoluble resin derived from pine wood and a volatile liquid suspending medium said refractory material and suspending medium being present in such relative proportions that the composition is in fluid form and said resin being present in an amount representing between about 1 and about 10% by weight of the entire composition. No. 2,270,770. Philip A. Ray to Hercules Powder Co.

Grinding and lapping composition comprising abrasive suspended in a complex comprising a polyvalent metal soap bearing grease and a soap bearing oil in intimate admixture, said soap bearing oil being water-emulsifiable. No. 2,270,888. Dean K. Murray and John M. Olson to Minnesota Mining and Mfg. Co.

Core oil comprising a polyhydric alcohol ester of an organic acid mixture derived from the liquor from the sulfate process treatment of pine wood comprising a major proportion of unsaturated fatty acids, a minor proportion of rosin acids and a small proportion of sterols. No. 2,270,947. William J. Hough.

Lubricant composition having metal surface corrosion inhibiting properties which includes a mineral oil, a mixture of 2 : 6-dimethyl phenol and 2 : 4 : 6-trimethyl phenol, and a mixture of mono-and dilorol phosphates. No. 2,271,044. Albert A. Schilling to Remington Arms Co., Inc.

Hectograph ink comprising an alcohol and water soluble dye subject to fading on exposure to light within the range of 3200 to 4000 A., a liquid carrier, and anthranilic acid dissolved therein. No. 2,271,112. Johan Bjorksten to Ditto, Inc.

Process for treating tubers in order to destroy parasites associated therewith which comprises subjecting a tuber in a closed space to contact with a mixture of carbon dioxide and oxygen containing from about 20% to about 50% by volume of carbon dioxide for at least 24 hours at a pressure of at least about 10 atmospheres. No. 2,271,171. Willem E. de Mol.

Process for manufacture of a stable food product rich in albumens comprising the steps of preparing a homogeneous paste comprising finely disintegrating fish meat in an incompletely coagulated condition shaping the pulp into products of comparatively small dimensions and subjecting the resultant fish paste products to drying. No. 2,271,272. Hjalmar Minde to Elrik Heen.

Method of dissolving from above 0.01% to about 0.3% of rotenone in a petroleum spray oil, consisting of heating in an open vessel substantially pure rotenone with a fatty oil which is soluble in the petrolem spray oil at a temperature and for a length of time, sufficient to dissolve the rotenone in the fatty oil thence adding the resulting liquid solution, while hot, to the petroleum spray oil. No. 2,271,350. Lloyd E .Smith and Herbert L. J. Haller to the free use of the Public in the United States of America.

Pest Control composition useful for controlling economically harmful lower forms of life including bacteria, fungi, and insects, containing as an active ingredient a linear polymeric onium salt. No. 2,271,378. Norman E. Searle to E. I. du Pont de Nemours & Co.

Method of applying decalcomania. No. 2,271,491. Harry C. Rathke to The Meyercord Co.

Water-treating compound for boilers and water heater. No. 2,271,499. Cyrus W. Rice.

Coal Tar Chemicals

Derivatives of 4, 4'-diaminodiphenyl sulphone. No. 2,268,754. Morris S. Kharasch and Otto Reinmuth to Eli Lilly and Co.

Anthrapyridone compounds selected from the group consisting of sulfonated and unsulfonated anthrapyridone compounds containing a member selected from the group consisting of hydrogen and an alkyl group in the 1-position, a member selected from the group consisting of a phenoxy and a naphtoxy group in the 2-position and a phenylamino group in the 4-position of the anthrapyridone nucleus said anthrapyridone compounds containing no other substituents in addition to those specified above. No. 2,268,814. Gordon F. Frame to Eastman Kodak Co.

Di (Aryl amino) alkacyl amide. No. 2,269,147. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

A nuclearly halogenated benzoic ester of polymerized vinyl alcohol. No. 2,269,187. Gaetano F. D'Alelio to General Electric Co.

N-aryl morpholone compound. No. 2,269,218. James G. McNally and Joseph B. Dickey to Eastman Kodak Co.

Method of recovering 2-aminopyrimidine from aqueous solutions which comprises reacting the 2-aminopyrimidine in solution with sulfur dioxide until an insoluble sulfite is formed and recovering the 2-aminopyrimidine sulfite by filtration. No. 2,269,274. Erwin Kuh to American Cyanamid Co.

An N-(alpha-beta-alkenylidene)-aminophenol. No. 2,269,450. Howard M. Fitch to E. I. du Pont de Nemours & Co.

Process comprising heating a dioxazine compound containing sulfonic acid groups and at least one substituent of the group consisting of the carboxylic acid group and groups which are saponifiable to the carboxylic acid group in an aqueous mineral acid until a test shows that a sample which is washed neutral is no longer soluble in hot water but is soluble in dilute aqueous alkali. No. 2,269,531. Heinrich Greune, Gerhard Langbein and Max Thiele to General Aniline & Film Corp.

An alkyl p-aminobenzoate selected from the class which consists of 1, 3-dimethylbutyl-p-aminobenzoate; 2, 4-dimethylpentyl-p-amino-

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benzoate; and 2-ethylbutyl-p-aminobenzoate. No. 2,269,791. Horace Shonle and Wilbur Doran to Eli Lilly & Co.

1-methylbutyl-p-aminobenzoate. No. 2,269,792. Horace Shonle and Wilbur Doran to Eli Lilly & Co.

N-paratoluene sulphonyl pyridine carboxyl amides. No. 2,270,201. William O. Frohring, Lester J. Szabo and Maurice Landy to S. M. A. Corp.

1, 9-pyrazolanthrone-6, 5(N)-benzacridone. No. 2,270,354. Frederic Stilmar to E. I. du Pont de Nemours & Co.

Manufacture of derivatives of 2-methyl-4-amino-pyrimidine. No. 2,271,503. Heinz M. Wuest and Max Hoffer to Hoffmann-LaRoche, Inc.

Coatings

Adhesive lacquer comprising an organic solution of a cellulosic film-forming substance, a resinous elastic plastic polyvinyl ester and a substance which is at least swellable in water and soluble in organic solvents, selected from the class consisting of mixed polymers from polyvinyl esters and maleic acid anhydride and mixed polymers of polyvinyl ethers and maleic acid anhydride. No. 2,268,651. John Eggert, Bruno Wendt, Adolf Jung to General Aniline & Film Corp.

Process of coating a support with an aqueous solution of a colloidal material capable of gelling at a given temperature. No. 2,269,169. Henry E. Van Derheof and Alfred E. Brooks to Eastman Kodak Co.

Method of producing corrosion resistant coatings on magnesium and magnesium alloys in which magnesium predominates, comprising forming on the surface of the metal an adherent coating by subjecting the metal to the action of an aqueous solution containing a water soluble dichromate and nitric acid and thereafter subjecting the coated metal to the action of an aqueous solution containing magnesium fluoride and a water soluble salt of chromic acid. No. 2,269,-435. Robert W. Buzzard.

Dyes, Stains

Pyrrolo methine and tri-methine cyanine backing dyes. No. 2,268,798. Leslie G. S. Brooker and Robert H. Sprague to Eastman Kodak Co

Polyazo dyestuffs and process of making same. No. 2,268,919. Walter Anderau to Society of Chemical Industry in Basle.

Dyestuffs of the triazol series and process of making same. No. 2,268,935. Walter Hanhart to Society of Chemical Industry in Basle.

Azo dyestuffs and their manufacture. No. 2,268,936. Armin Hasler and Achille Conzetti and Adolf Krebser to J. R. Geigy A. G.

Method removing a filter dye containing an aldehyde group from a photographic film containing image dyes selected from the class consisting of indophenol indaniline and azomethine dyes which comprises dissolving the filter dye in a solution of sodium bisulfite and a fatty alcohol without affecting said image dyes. No. 2,269,146. LeRoy M. Dearing to Eastman Kodak Co.

Polymethine dye intermediates. No. 2,269,234. Robert H. Sprague to Eastman Kodak Co.

Iodine-containing dyestuffs consisting of a tetrazotized polynuclear diamine component coupled with a component of the group consisting of a naphthol monosulphonic acid, a naphthol disulfonic acid, an aminoaphthol monosulfonic acid, an aminoaphthol disulfonic acid, at least one of the components containing iodine in its molecule. No. 2,269,366. Alan Goldberg and Bertold Wiesner to Ward Blenkinsop & Co., Ltd.

An iron blue of improved alkali resistance, comprising a pigment ferric ferrocyanide containing 1% to 10% by weight of film-forming alkali metal boriphosphate uniformly distributed through the pigment. No. 2,269,516. Thomas Brown to Interchemical Corp.

An azo composition produced by coupling diazotized 3-nitro-4-aminotoluene with acetoacetanilide and aceto acet-p-chloro-anilide wherein the molecular proportion of coupled acetoacetanilide to coupled acetoacet-p-chloro-anilide is about the shade of the azo compound m-nitro-p-toluidine-acetoacetanilide but having greater tinctorial strength. No. 2,269,885. Harry Twitchett to Imperial Chemical Industries, Ltd.

Vat dyestuffs of the anthraquinone series. No. 2,270,168. Walter Mieg and Franz Wieners to General Aniline & Film Corp.

In process of preparing tetrabromoindigo the step which comprises treating indigo with a mixture of bromine and concentrated sulfuric acid, a nitrite having been added to said mixture. No. 2,270,170. Paul Nawiasky and Enno Wolthuis to General Aniline & Film Corp.

Selenotricarbocyanine dyes. No. 2,270,255. Leslie Brooker to Eastman Kodak Co.

Photographic sensitizing dye. No. 2,270,378. Edmund B. Middleton and Andrew B. Jennings to du Pont Film Mfg. Corp.

Stilbene dyestuffs and their manufacture. No. 2,270,451. Ernst Keller to J. R. Geigy A. G.

Diazo dyestuffs and their manufacture. No. 2,270,454. Adolf Krebser and Werner Bossard to J. R. Geigy A. G.

Azo dyestuffs. No. 2,270,478. Max Schmid to Society of Chemical Industry in Basle.

Arylsulfonamide azo dye intermediates. No. 2,270,570. Byron L. West and Dale R. Eberhart to American Cyanamid & Chem. Corp.

Polyazo dyestuffs. No. 2,270,675. Eberhard Stein, Hugh Schweitzer and Carl Taube to General Aniline & Film Corp.

Monoazo dyestuffs insoluble in water. No. 2,270,678. Ernst Fischer to General Aniline & Film Corp.

Composition for coloring comprising an organic coloring material containing at least one solubilizing group in the molecule and xanthinic base. No. 2,270,756. Jean G. Kern to Allied Chemical & Dye Corp.

Process removing dissolved chlorine compounds from an alkali metal hydroxide solution containing the same which includes subjecting said solution to electrolysis at a voltage in excess of the polarization voltage of the alkali metal hydroxide solution to liberate oxygen reacting on said chlorine compounds with said oxygen to form chlorates which are substantially insoluble in said solution and separating said chlorates from said solution. No. 2,270,376. Edward T. Ladd to Innis, Speiden & Co.

Process for manufacture of carboxylic acids of the cyclopentano polyhydro phenanthrene series comprising abstracting the elements of water from compounds of the cyclopentano polyhydro phenanthrene series containing a cyanhydrin grouping of the 17-position and thereby forming the corresponding 16-unsaturated nitriles and hydrolyzing the resulting 16-unsaturated nitriles to the corresponding carboxylic acids. No. 2,270,409. Adolf Butenandt, Hans Dannenbaum and Josef Schmidt-Thome to Schering Corp.

System for reducing sulfur dioxide to sulfur by natural gas. No. 2,270,427. Edward P. Fleming and T. C. Fitt to American Smelting and Refining Co.

Morpholine compound and method of preparation. No. 2,270,490. William H. Wood to Harris-Seybold-Potter Co.

Process for regenerating caustic alkali solutions. No. 2,270,491. David L. Yabroff and Ellis R. White to Shell Development Co.

Process making ammonium bifluoride comprising contacting gaseous NH_3 and gaseous HF in approximately the proportions in which they combine to form NH_4FHF, both gases being substantially anhydrous and contacting the resulting gaseous NH_4FHF with air at a temperature of below 50° C. No. 2,270,498. Abe R. Bozarth to The Harshaw Chemical Co.

Substantially non-aqueous stable, liquid zein coating composition which is stable against separation of the zein at temperatures of 70° F. No. 2,270,508. Roy E. Coleman to Time, Inc.

Method of preparing zirconium dioxide comprising heating in an electric arc furnace a mixture of zirconium ore and carbon forcing air directly into the arc during said heating step forming a reaction mass of zirconium carbon and nitrogen exposing to the atmosphere said mass prior to cooling to atmospheric temperature and continuing to expose said mass to the atmosphere until substantially all the material is reacted to zirconium dioxide. No. 2,270,527. Charles J. Kinzie, Robert P. Easton and Viatcheslav V. Efimoff to The Titanium Alloy Mfg. Co.

Sulfonic acid amide compound. No. 2,270,676. Robert Behnisch, Josef Klarer and Fritz Mietzsch to Winthrop Chemical Co.

Salts of certain methylene diamines with certain petroleum sulfonic acids. No. 2,270,681. Melvin De Groote to Petrolite Corp., Ltd.

Method producing acrolein which comprises substantially saturating a mercuric sulfate reagent with propylene at a temperature below 70° C. and heating the resulting composition to a temperature above 70° C. to effect conversion of propylene into acrolein. No. 2,270,705. Karl M. Herstein to Acrolein Corp.

Method comprising heating a substance chosen from the group consisting of guanidine sulfamate, substituted quanidine sulfamates, guanyl urea sulfamates to a temperature sufficient to evolve ammonia and recovering the corresponding sulfonic acid. No. 2,270,755. William H. Hill to American Cyanamid & Chem. Co.

Process for carrying out a controlled partial oxidation of an exothermically oxidizable hydrocarbon compound in the vapor phase by means of a gas comprising free molecular oxygen at the temperature and pressure required for the oxidation which comprises carrying out said oxidation in the presence of an anti-knock reagent and of a metal oxidation-catalyst said catalyst not being substantially poisoned by said anti-knock reagent. No. 2,270.779. Ernst Berl to Berl Chemical Corp.

Process of directly oxidizing ethylene to ethylene oxide which comprises partially oxidizing ethylene with gaseous oxygen in the presence of tetra-ethyl lead in an amount of less than .5% by volume of the reactants. No. 2,270,780. Ernst Berl to Berl Chemical Corp.

Azo compound and material colored therewith. No. 2,271,220. Joseph B. Dickey and John R. Byers, Jr. to Eastman Kodak Co.

Color-forming photographic developer comprising a primary aromatic amino developing agent a coupler compound and 5-nitroindazole. No. 2,271,229. Willard D. Peterson and Ralph M. Evans to Eastman Kodak Co.

Sulfonamides of dyes. No. 2,271,230. Willard D. Peterson and Arnold Weissberger to Eastman Kodak Co.

Color-forming photographic developer comprising an aromatic amino developing agent and a coupler compound having the formula $R\text{-}COCH_2CONH\text{-}R'\text{-}Su$, where R is selected from the group consisting of alkyl aryl and furoyl radicals R' is an arylene radical and Su is a sulfonamide group. No. 2,271,238. Paul W. Vittum, Willard D. Peterson and Henry D. Porter to Eastman Kodak Co.

Equipment—Apparatus

Means for separating particles of solid material by flotation. No. 2,268,652. Russell Scott Ellis.

Apparatus for refining lubricating oils. No. 2,268,706. Carl E. Holt.

An apparatus for producing granular phosphatic fertilizer material. No. 2,268,816. William H. Gabeler, Alvin C. Wilson and Thomas O. Tongue to The Davison Chemical Corp.

An apparatus for chilling a liquid to produce a solid edible product a chilling chamber, means for introducing liquid to be chilled into said chamber and a plurality of members within said chamber for kneading and rubbing congealed material and liquid, said members having relatively flat outer surfaces coacting to remove congealed material continuously from the surfaces of each other and having means pressed resiliently against the surface of said chamber to scrape material therefrom. No. 2,268,905. Gordon C. Schaub and Jacob Schaub to The Best Foods, Inc.

Apparatus for making hydrogen. No. 2,268,910. Albert R. Stryker to Chester Tietig.

Method and apparatus for drying printing ink. Nos. 2,268,985, to 2,268,988. Frederick O. Hess to Interchemical Corp.

Application of fluorescent material to electron tubes. No. 2,269,129. Joseph F. Rugledge to Allen B. Du Mont Labs., Inc.

In a high vacuum thin film unobstructed path still provided with vaporizing and condensing surfaces which are separated by substantially unobstructed space the improvement which comprises a vaporizing surface which is coated with aluminum powder. No. 2,269,153. John C. Hecker to Distillation Products, Inc.

Method for preservation of low temperature refrigerants such as dry ice, liquid air and the like which comprises the steps of enclosing the refrigerant in an insulated chamber surrounding the chamber with a barrier of dry ice immersed in a liquid and insulating said dry ice from its surroundings. No. 2,269,172. Wilfred T. Birdsall to Mergenthaler Linotype Co.

Electric arc welding process and device therefor. No. 2,269,369. Georg Hafergut to Elin Aktiengesellschaft fur elecktrische Industrie.

An extruded asbestos-cement pipe composed of a hardened plastic mixture of cement and asbestos fiber in which substantially all the fibers are mechanically arranged during extrusion to run lengthwise of the pipe. No. 2,269,436. Arthur B. Christopher to The Ruberoid Co.

Furnace apparatus and method of calcining lime with recovery of carbon dioxide. No. 2,269,580. George Connolly to Nichols Engineering & Research Corp.

Electric furnace for the activation of granular charcoal comprising an elongated tubular, chamber, a plurality of electrodes arranged in pairs on opposite sides of the chamber, means to feed granular charcoal through said chamber, the space between electrodes being bridged by charcoal particles, one group of electrodes constituting a preheating zone wherein the entering charcoal is gradually brought to substantially activating temperature, another group of electrodes constituting an activating zone wherein the charcoal is maintained at activating temperature, means to admit hot activating as to said activating zone, and means to withdraw said activating gas and gases evolved by the charcoal directly from said activating zone, whereby said gases are prevented from entering said preheating zone and from contacting said charcoal in said preheating zone. No. 2,270,245. Maurice Barker.

Method of accelerating the ignition of liquid fuels in an internal combustion engine of the type wherein ignition of the fuel is spontaneously affected by injection into the compressed air in the engine cylinder which comprises admixing with the fuel prior to ignition a minor proportion of tetranitromethane. No. 2,270,400. Joseph A. Wyler to Trojan Powder Co.

Clarifying means for closed liquid solvent cleaning systems said means including a still having a bottom outlet a closed receptacle for holding used solvent into which said outlet discharges a trap in said outlet, and an air vent in communication with said receptacle said air vent controlling the rate of flow into said receptacle to prevent solid material from being carried through said trap. No. 2,270,609. Stuart A. Smith.

Cleaning and degreasing system. No. 2,270,642. Howard E. Somes to Budd Induction Heating Inc.

Apparatus for the reduction of oxides. No. 2,270,701. Hans Galluser.

Process of transferring heat. No. 2,270,717. Fladimir L. Shipp and John Happel to Socony-Vacuum Oil Co.

Check system for controlling the admission of chlorine under pressure through a chlorine line into a pressure delivery line of a chlorination system and against the pressure in the delivery line through which material to be chlorinated is delivered under pressure which comprises means responsive to a drop in pressure in the delivery line to a predetermined value for introducing dry air into the chlorine line and means for initiating the termination of the admission of chlorine to the delivery line automatically simultaneously with the introduction of the air into the chlorine line. No. 2,270,785. Gregory A. Petroe to The Mathieson Alkali Works, Inc.

Non-explosive gas producing projectile adapted to be fired from a gun. No. 2,271,280. Carl Reinhold Weinert to Federal Laboratories, Inc.

Electrolytic cell for producing insoluble metal salts. No. 2,271,341. Gunnard E. Johnson, Reginald G. Bowman and William J. Knox, Jr. to International Smelting & Refining Co.

Hydrogen ion indicator. No. 2,271,478. Kenneth R. Eldredge.

Centrifugal separating process. No. 2,271,501. Ashton T. Scott to The Sharples Corp.

Fine Chemicals

Method of matting or delustering a light-sensitive silver halide gelatin emulsion which method comprises dissolving an organic cellulose derivative in an organic solvent therefor, by adding water to the resulting solution, while stirring to effect precipitation of the cellulose derivative in a colorless form, and adding the dispersion thus formed to a molten silver halide gelatin emulsion. No. 2,268,662. Julius Knoefel to General Aniline and Film Corp.

Aqueous solution of the reaction product of sulfapyridine with an aldose selected from the class which consists of xylose, d-arabinoselarabinose, rhamnose, galactose, glucose, and maltose, said solution having a pH between 7.0 and 7.6. No. 2,268,780. Horace A. Shonle to Eli Lilly and Co.

Detoxified local anesthetic comprising a mixture containing a member selected from the group consisting of procaine and butyn and an organic calcium salt selected from the group consisting of levulinate lactate and salicylate. No. 2,268,915. Helene Wastl and Reinhard Beutner to Hahnemann Research Foundation.

Process for manufacture of bacterial products and bacteria strains which comprises cultivating bacteria on a nutrient not foreign to the body and consisting of piasma. No. 2,268,955. Rolf Meier to Ciba Pharmaceutical Products, Inc.

Secondary and tertiary 3-amino-methyl-polyhydroxy-phthalides. No. 2,268,990. Siegfried Loewe.

Solution containing ergot alkaloid and from 0.1 to 0.5% of ascorbic acid and having great stability against deterioration with respect to its therapeutic properties. No. 2,269,145. Samuel H. Cutler and Robert E. Himelick to The Upjohn Co.

Phenol-formaldehyde photographic sub. No. 2,269,220. Gale F. Nadeau to Eastman Kodak Co.

Production of colored photographic images. No. 2,269,481. John Reindorp to Ilford Limited.

Compound having the formula (AmX)4M(Am)4, where Am represents an organic amine, X a halogen, and M a metal of the fourth group of the periodic system. No. 2,269,498. Eugene Wainer to The Titanium Alloy Manufacturing Co.

Isocytosine, method for preparation. No. 2,269,652. Jackson English and Richard Roblin, Jr. to American Cyanamid Co.

Metallic bromides, process and manufacture thereof. No. 2,269,733. Edward Pearson to American Potash & Chemical Corp.

Colloidal solution derived from the interaction of aqueous mercuric chloride and a stoichiometric excess of aqueous sodium linoleate and characterized by germicidal power, low surface tension, and ready miscibility with aqueous fluids. No. 2,269,743. Raymond Stone.

Method of precipitating neoarsphenamine in a condition adapted for drying, which comprises neutralizing the excess alkali in a concentrated aqueous solution of neoarsphenamine until the solution is no longer alkaline to phenolphthalein, adding sodium chloride, and introducing the resultant solution gradually into cold ethyl alcohol while agitating. No. 2,270,269. Walter Christiansen and Alfred Jurist to E. R. Squibb & Sons.

In production of levulinic acid, the steps which comprise subjecting a reaction mixture of a dextrose-producing carbohydrate and hydrochloric acid to heat and pressure to produce a conversian of said carbohydrates to levulinic acid and humin type compounds and subjecting the mixture to sufficient mechanical agitation during the conversion reaction to produce a granular type of humin compound. No. 2,270,328. Wendell Moyer to A. E. Staley Manufacturing Co.

Process for the manufacture of new derivatives of compounds of the suprarenal cortical hormone series, comprising treating -21-oxy-pregnene-dione-(3, 20) with acetobromoglucose in contact with silver oxide. No. 2,270,379. Karl Miescher and Werner Fischer to Ciba Pharmaceutical Products, Inc.

Process for manufacture of glucoside derivatives comprising treating a non-steroid which is of phenol character and has the effect of steroid hormones and is a member of the group consisting of alkyl- and alkenyl- polyphenols, with an esterifying derivative selected from the group consisting of the acyl and acyloxyhalogen compounds of the saccharides and with a catalyst useful in furthering etherification. No. 2,270,380. Karl Miescher and Werner Fischer and Jules Heer to Ciba Pharmaceutical Products, Inc.

Saturated aliphatic hydrocarbon ammonium chromate. No. 2,270,386. Clifford K. Sloan to E. I. du Pont de Nemours & Co.

Process for preparation of dl-α-tocopherol which comprises heating trimethyl-hydroquinone-monophytyl ether to effect rearrangement and treating the transformation product with an acid condensing agent. No. 2,270,634. Otto Isler to Hoffman-LaRoche, Inc.

Composition of matter comprising acetyl salicylic acid in even distribution with quinine dihydrochloride which composition contains its components in a practically stable form. No. 2,270,689. Ludwig Schutz to Winthrop Chemical Co., Inc.

Photographic element comprising a support having thereon a sensitive emulsion layer and an antihalation layer of an alkali-soluble synthetic colloidal material containing colloidal carbon dispersed therein with a dispersing agent. No. 2,271,234. Cyril J. Staud and Walter J. Weyerts to Eastman Kodak Co.

Mercaptothiazine spiro compounds and process of making same. No. 2,271,400. Paul Swithin Pinkney to E. I. du Pont de Nemours & Co.

Industrial Chemicals

Reissue. **Process of refining** animal and vegetable oils. No. 21,992. Benjamin Clayton to Refining Inc.

Non-volatile combustible organic material and, in added amount sufficient to act as a fire-retardant therefor, a compound containing the phytyl radical attached to a cation of the class consisting of inorganic cations and nitrogen-containing organic cations having a carbon to nitrogen ratio not exceeding 2.1 No. 2,268,556. Roger Adams and Charles W. J. Wende to E. I. du Pont de Nemours & Co.

Process refining oils containing free fatty acids; that is, animal, vegetable, and fish oils, which comprises; mixing the oil with a reagent capable of saponifying said acids; injecting compressed air into said mixture; forcing the mixture to flow at a high velocity in a thin stream through a reaction chamber in which the fatty acids are intimately contacted with the reagent due to the turbulence of said stream; and thereafter separating said air and the reaction products produced by the action of said reagent on said acids from the oil. No. 2,268,567. Benjamin Clayton, Walter B. Kerrick and Henry M. Stadt to Refining, Inc.

Furnace particularly adapted for producing ferric oxide from ferrous sulfate. No. 2,268,538. Allen Harrison and Frederic Barnes to Pilkington Brothers, Ltd.

Process which comprises preparing a seed material for the improvement of bituminous substances of poor quality which comprises heating a bituminous substance together with a catalyst selected from the group consisting of zinc chloride, aluminum chloride and iron chloride at temperatures between about 160° C. and about 200° C. and for a time which will allow polymerization to take place, and thereafter adding the seed material so produced to a larger bulk of bituminous substance to be improved. No. 2,268,602. Richard Lichtenstern.

Insoluble ammonia-hydrocarbon dihalide condensation products. No. 2,268,620. George W. Rigby to E. I. du Pont de Nemours & Co.

Composition for purifying liquid sewage and industrial waste-water by the precipitation of impurities from the liquid to be purified, said composition consisting of about 4% of mercurous oxide, about 11% of potassium dichromate, and about 8½% of zinc oxide in mixture with water-soluble alkaline salts. No. 2,268,648. Henry Dreyfus.

Method of forming fused chemical material into pellets comprising the steps of circulating the molten material into through and out of a drop forming chamber, withdrawing a lesser portion of such material than that circulated in the form of droplets from said chamber and dropping them on a cooling surface to form solidified pellets and controlling the temperature and fluidity of that portion of material instantaneously in said chamber by varying the rate of such circulation. No. 2,268,888. Francis C. Mericola to Michigan Alkali Co.

A hydrated reaction product of a fused compound of lead oxide and silicon dioxide and characterized by a molecular structure within the approximate range $2PbO \cdot SiO_2H_2O$ to $3PbO \cdot 4SiO_2H_2O$. No. 2,268,913. Forrest L. Turbett & George J. Vahrenkamp to The Eagle-Picher Lead Co.

Reaction product of a monomeric alkyl phenol alcohol in which the alkyl group contains from 4 to 5 carbon atoms with a polyhydric alcohol reactive therewith to form a monomeric ether alcohol said product being a monomeric phenolic ether alcohol soluble in aromatic hydrocarbons, insoluble in aliphatic hydrocarbons on heating forming a condensation product which remains fusible and soluble and exhibiting pronounced reactivity with acidic substances. No. 2,268,946. William Krumbhaar.

Method producing reaction products which comprises reacting an alkyl phenol in which the alkyl group contains from 4 to 5 carbon atoms with formaldehyde under conditions to produce a monomeric alkyl phenol alcohol, reacting at a temperature below 40° C. under a vacuum of not above about 30 mm. pressure said monomeric alkyl phenol alcohol with a polyhydric alcohol reactive therewith to produce a monomeric etherified alkyl phenol alcohol and esterifying the resulting etherified alkyl phenol alcohol with an acid. No. 2,268,947. William Krumbhaar.

Process of reducing the fluoride content of potable water which comprises contacting the water with a water-insoluble chemical compound characterized in that it is charged with uncombined aluminum ions which react with the fluoride ions to effect their removal. No. 2,268,971. Oliver M. Urbain and William R. Stemen to Charles H. Lewis.

In treatment of a mixture of nitrosyl chloride and chlorine in metal apparatus the improvement which comprises constructing the surfaces of said apparatus with which said mixture is contacted of a metal from the group consisting of nickel and alloys of nickel containing 45% or more nickel and while said mixture is in contact

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with said metal excluding from the mixture moisture in amount in excess of 0.1% by weight. No. 2,268,999. Herman A. Beekhuis, Jr. to The Solvay Process Co.

Production of nitrates from nitric acid and chlorides. No. 2,269,000. Herman A. Beekhuis, Jr. to The Solvay Process Co.

Dry distillation of shale and other slate-shaped materials. No. 2,269,-025. Edvin A. Johansson.

In process for the conversion of carbonaceous materials in the vapor phase at an elevated temperature at least equal to 750° F. wherein the reactant vapors are contacted with a catalyst susceptible to contamination by iron in the presence of a ferrous metal and the catalyst is periodically regenerated in situ by the oxidation of combustible deposits therefrom the step of inhibiting the contamination of the catalyst by iron which comprises maintaining in the feed to the reaction zone from 0.0006% to 0.015% sulfur in the form of a volatile oxygenated sulfur compound. No. 2,269,028. George E. Liedholm and Robert M. Cole and Irving I. Shultz to Shell Development Co.

Finely comminuted oxides, method of preparing. No. 2,269,059. Dan McLachlan, Jr. to Corning Glass Works.

Lead oxide powder, method and apparatus for making. No. 2,269,094. Joseph Lester to The Electric Storage Battery Co.

Process of producing a nitrile of a carboxylic acid comprising reacting a carboxylic acid amide with the chloro-formiate of trichloromethyl alcohol. No. 2,269,105. Winfrid Hentrich and Heinz-Joachim Engelbrecht to Deutsche Hydrierwerke Aktiengesellschaft.

Process for dehydrating aliphatic acids by a combined extraction distillation method. No. 2,269,163. Donald F. Othmer to Tennessee Eastman Corp.

Welding flux having as its principal ingredient non-gassing wollastonite particles that will pass a 10-mesh screen and will not pass an 80-mesh screen. No. 2,269,167. Gareth G. Somerville and Garnett H. Porter to General Electric Co.

Industrial ethyl alcohol denatured with 0.5 to 5 parts of an alkyl furoate in which the alkyl group contains less than 3 carbon atoms as an essential denaturing element per 100 parts of 95% ethyl alcohol. No. 2,269,192. Louis J. Figg, Jr. and James W. Rhea to Eastman Kodak Co.

Industrial ethyl alcohol denatured with 0.5 to 5 parts of dialkyl carbonate in which each alkyl group contains less than four carbon atoms as an essential denaturing element per 100 parts of 95% ethyl alcohol. No. 2,269,193. Louis J. Figg, Jr. and James W. Rhea to Eastman Kodak Co.

Method of preserving liquid sugar against decomposition and of improving the yield therefrom of food products including crystal sugar syrup, molasses and distillates which comprises admixing acetaldehyde with the liquid sugar prior to a period of storage and thereafter evaporating the acetaldehyde. No. 2,269,203. Lawrence T. Hopkinson.

Preparation of oils containing antioxidants. No. 2,269,243. James G. Baxter and Jakob L. Jakobsen to Distillation Products, Inc.

Process for the removal of iron and other metallic elements from water, which comprises subjecting said iron and other metallic elements to the adsorptive action of lignin, which has been obtained from undecomposed plant materials, in the proportion of substantially 1 milligram of lignin per liter of water having up to 10 parts per million of said iron and other metallic elements; thence stirring the mixture; thence filtering through sand and other suitable filters, and thereby producing a filtrate substantially free from iron and other metallic elements. No. 2,269,315. Gussie Nelson, Max Levine and Daniel Lynch to Henry A. Wallace, Sec. of Agric. of the U. S. A.

Shellac-cashew nut shell liquid material reaction product. No. 2,269,347. William Schaufelberger to The Harvel Corp.

Disubstituted cyanamides. No. 2,269,399. Richard Roblin, Jr. to American Cyanamid Co.

Method of removing soluble iron and copper impurities from ethyl lactate which includes the step of reacting said metal constituents with oxalic acid and filtering off the insoluble metallic oxalates. No. 2,269,402. Farris Swackhamer to American Cyanamid Co.

Emulsifier comprising a higher fatty acid ester of a polymerized polyhydric alcohol, the hydroxyl content of the polymerized polyhydric alcohol being substantially completely esterified, the fatty acid represented in the ester being non-polymerized and non-oxidized, and the polymerized polyhydric alcohol represented having an average molecular weight of at least approximately 500. No. 2,269,-529. Henry Goldsmith to Harry Bennett.

Production of carbon chloride compounds of the formula C_4Cl_6. No. 2,269,600. Martin Mugdan and Josef Wimmer to Consortium fur Elektrochemische Industrie.

Method producing finely divided calcium sulfite for use in coating and filling paper, which comprises passing sulfur dioxide accompanied by vigorous agitation into an aqueous reaction medium containing 1 to 20 per cent. sucrose and a milk of lime suspension having a temperature above 60° C. and a concentration of about 150 to 200 grams of lime per liter of reaction medium. No. 2,269,-608. J. Strieby to Paper Patents Co.

Method refining oils, fats and waxes which comprises generating chlorine dioxide and an inert gas in the presence of but in a zone in contact with and below the oil, fat or wax to be bleached whereby the mixed gases diffuse into the material to be bleached. No. 2,269,667. Hugo Kauffmann to Buffalo Electro-Chemical Co.

Phosphatide product, and process of obtaining it. No. 2,269,772. Norman Kruse to Central Soya Co., Inc.

A liquid composition comprising iron pentacarbonyl and, as an agent for stabilizing the latter against decomposition by light, the product of the reaction of iron pentacarbonyl with an alkanol amine, which reaction product contains an iron carbonyl radical and an alkanol amine radical chemically combined in the same molecule. No. 2,269,825. William McPherson and Leo Christensen to The Dow Chemical Co.

A red liquid product of the reaction of a liquid iron carbonyl with an alkanol amine. No. 2,269,826. William McPherson and Leo Christensen to The Dow Chemical Co.

Treatment of oleaginous material. No. 2,269,898. Raymond Anderson to The V. D. Anderson Co.

Process of treating syenites containing iron bearing impurities. No. 2,269,912. Raymond Ladoo and William Hubler.

Hydroxy aldehydes and ketones, process for producing. No. 2,269,-935. William Hanford and Richard Schreiber to E. I. du Pont de Nemours & Co.

Process of preparing dicarboxylic acids of eleven and twelve carbon atoms, which comprises oxidizing an ester of 12-hydroxystearic acid with nitric acid. No. 2,269,998. Edward Czerwin to E. I. du Pont de Nemours & Co.

Use of gas hydrates in improving the load factor of gas supply systems. No. 2,270,016. Matthew E. Benesh to Chicago By-Products Corp.

Composition of matter for absorbing carbon dioxide comprising an alkaline carbon dioxide absorbent and a small proportion of a substance which changes color at a pH between 11 and 14.5 which substance will retain its color-changing characteristics in contact with the ingredients and will not become oxidized or reduced under normal conditions said composition visually indicating when its ability to absorb carbon dioxide has been materially decreased. No. 2,270,025. John R. Ruhoff to Mallinckrodt Chemical Works.

Luminescent material and method of manufacture. No. 2,270,105. James N. Bowtell, Henry G. Jenkins and Alfred H. McKeag to General Electric Co.

Luminous substance comprising a heat treated combination of one or more of the materials belonging to the group of compounds consisting of the borates and phosphates of the **alkali metals,** the metals of the second group of the periodic system excepting mercury and the metals of the third group of the periodic system activated by 0.05 to 30 mol. per cent. of one or more activating materials belonging to the group of compounds consisting of the borates and phosphates of silver, thallium, tin and lead. No. 2,270,124. Magdalene Huniger and Hans Panke to General Electric Co.

Method producing isomeric trioxymethylene which comprises contacting trioxymethylene with a catalyst selected from the group consisting of volatile metallic halides and volatile halides of boron and silicon dissolved in an inert organic solvent. No. 2,270,135. Louis A. Mikeska and Erving Arundale to Standard Oil Development Co.

Apparatus for dehydrating sirup or the like. No. 2,270,138. Donald J. Pentzer, Herbert G. Miller and Lee F. Moon.

Method of recovering sulphur from waste liquors of the viscose artificial silk industry which comprises adding sodium sulfate and sulfuric acid to a waste liquor containing sodium sulfides and cellulose decomposition products to form colloidal sulfur therein raising the sodium sulfate content of said liquor to 35 to 40 grams per liter and the sulfuric acid content thereof to 15 to 25 grams per liter, heating said liquor to a temperature of about 80° C. and then while cooling allowing the liquor to stand to precipitate the sulfur contained therein in a condition amenable to rapid settling and filtration. No. 2,270,174. Johann J. Stoeckly and Elmar Profft to North Amer. Rayon Corp.

Organic peroxide. No. 2,270,175. Harco Jacob Tadema to Shell Development Co.

Method which comprises atominizing a solution of a polymerized vinyl aromatic compound and a non-volatile plasticizer therefor in a volatile organic solvent by admixture with steam heated sufficiently to vaporize the solvent while preventing condensation of the organic solvent vapors in the presence of the residual polymer whereby the polymer is produced in a pulverulent plasticized form substantially free of volatile ingredients. No. 2,270,182. William R. Collings, Gordon P. Schmelter & Frederick E. Dulmage to The Dow Chemical Co.

Dialkylphenol sulfides. No. 2,270,183. Elmer W. Cook and William D. Thomas to American Cyanamid & Chem. Corp.

Process for continuous production of an oxime from a cycloalkanone and an aqueous solution of a mineral acid salt of hydroxylamine and a substance whole solutions are basic in reaction which comprises gradually adding one of the reaction components other than the cycloalkanone to a liquid containing the cycloalkanone flowing continuously through a reaction vessel. No. 2,270,204. Paul Schlack to E. I. du Pont de Nemours & Co.

Process for the oxidation of a lower aliphatic ketone to form an acid comprising oxidizing the ketone while in vapor form with gas containing free oxygen in the presence of at least one volume of inert gas for each volume of ketone vapor and oxygen present. No. 2,270,252. Joseph Bludworth to Celanese Corp. of America.

Method of oxidizing an alkali metal xanthate to a dixanthogen which comprises adding an alkali metal hypochlorite to an aqueous solution of the xanthate and maintaining the temperature within the approximate range of from 15° to 25° C. throughout the oxidation. No. 2,270,257. George Browning, Jr. to The B. F. Goodrich Co.

In preparation of reactive carbohydrates, the improvement which comprises treating a carbohydrate with an earth alkali metal dissolved in liquid, anhydrous ammonia. No. 2,270,326. Clemmy Miller and Arthur Siehrs to North American Rayon Corp.

Fluid for use in hydraulic pressure apparatus comprising the combination of a silicyl derivative of a ricinoleic acid ester of a polyhydric alcohol wherein the silicyl group is linked directly to the ricinoleic acid group and an ether of a polyhydric alcohol. No. 2,270,352. Frank Sowa to International Engineering Corp.

Process for extracting liquefiable organic constituents from a gas mixture. No. 2,270,852. Paul M. Schuftan to The British Oxygen Co., Ltd.

Continuous process of saponification. No. 2,270,856. Ivor M. Colbeth to The Baker Castor Oil Co.

Method of heat-treating materials in process such as production of portland cement or reduction of ores. No. 2,270,870. Marvin W. Ditto and Robert F. Leftwich to Emulsions Process Corp.

Process for the production of krypton and xenon from air which comprises compressing and cooling air, compressing, cooling and liquefying a relatively small portion of air, washing said cooled air with a portion of the liquefied air to form a washing liquid containing krypton, rectifying said washing liquid with another portion of said liquefied air, withdrawing the rectified washing liquid at a relatively high rate, effecting rapid evaporation of a major portion of said withdrawn liquid under continuous downflow, separating the vapors of said evaporation from the remainder of the withdrawn liquid, returning said vapors to said rectification step to be rectified with additional portions of washing liquid, and withdrawing from said separation the remainder of the liquid containing a relatively high concentration of krypton. No. 2,270,880. Heinrich Kahl.

In method of producing a synthesis gas mixture of carbon monoxide and hydrogen in a catalytic contact zone in which a mixture of hydrocarbon gas, steam and carbon dioxide is converted into synthesis gas in the presence of a nickel catalyst between temperatures of 1800° F. and 2200° F., the step of bleeding a portion of the synthesis gas mixture, subjecting the bled portion to oxidation by means of an easily reducible metal oxide to form carbon di-

oxide and steam, and introducing the carbon dioxide and steam to the catalytic zone as the carbon dioxide and steam used during the conversion step. No. 2,270,897. George Roberts, Jr., Walton H. Marshall, Jr., Dustin W. Wilson and Percival C. Keith, Jr. to The M. W. Kellogg Co.

Method of treating gases with pulverulent substances. No. 2,270,903. Wolfgang Rudbach to Bamag-Meguin Aktiengesellschaft.

Controlling temperatures in simultaneously conducted endothermic and exothermic reactions. No. 2,270,913. Maynard P. Venema to Universal Oil Products Co.

Method of producing chlorine by oxidation of hydrogen chloride. No. 2,271,056. Frederick R. Balcar to Air Reduction Co., Inc.

Preparation of polyhydric alcohols of 2 to 4 carbon atoms comprising submitting to hydrogenation sugars of 2 to 4 carbon atoms dissolved in a substantially anhydrous solvent therefor until hydrogen absorption nearly stops and further submitting to hydrogenation the resulting partially converted product dissolved in a solvent containing substantial quantities of water on the basis of the partially converted product, the remaining constituents of the solvent being essentially non-reactive with the partially converted product. No. 2,271,083. Eugene J. Lorand to Hercules Powder Co.

Alkyl sulfate liquors, process for preparing. No. 2,271,092. Granville A. Perkins and John A. Davies to Union Carbide and Carbon Corp.

Process for producing high molecular weight substance which comprises reacting a halogen derivative of a hydrocarbon selected from the class consisting of aromatic hydrocarbons and saturated aliphatic hydrocarbons with an unsaturated aromatic compound which contains an olefinic linkage and which is capable with the aid of an acid-reacting inorganic halide of being polymerized to a product having a molecular weight of at least 600. No. 2,271,093. Mathias Pier and Friedrich to William E. Currie.

Process producing new phosphatidic compounds. No. 2,271,127 Morris Mattikow to Refining, Inc.

Process for promoting reactions of organic materials which are susceptible to the catalytic effect of an active chromium oxide catalyst which comprises contacting said organic materials at elevated tem perature with a catalyst comprising gel-type chromium oxide prepared by reacting chromium trioxide and a reducing agent in aqueous solution to form a gelatinous reduction product and drying said gelatinous product. No. 2,271,356. John Turkevich and Robert F. Ruthruff to Process Management Co., Inc.

Anhydrous monocalcium phosphate, process of production. No. 2,271,-361. Frank B. Carpenter, Jr. and Wilbur K. Enos to Virginia Carolina Chemical Corp.

Homogeneous emulsion interpolymer of a polymerizable monomeric open-chain aliphatic conjugated diene, a polymerizable monomeric vinyl ester of an alpha, beta saturated aliphatic monocarboxylic acid and a polymerizable monomeric monohydric alcohol ester of an alphamethylene aliphatic open-chain monocarboxylic acid. No. 2,271,384. Harold W. Arnold to E. I. du Pont de Nemours & Co.

Process of producing casein solutions of reduced foaming tendency which comprises applying to solid casein, a small amount of tributyl citrate, the amount of the latter being not substantially above 5%, based on the amount of said casein, and thereafter dissolving the casein in an aqueous solvent. No. 2,271,389. John F. Corwin and Robert C. White to The Borden Co.

Process of producing soap, which comprises forming a body of molten substantially anhydrous alkali in a closed chamber out of contact with the atmosphere and gradually introducing saponifiable materials into said body of molten alkali until molten substantially anhydrous neutral soap is formed, and cooling the resulting soap before contacting the same with the atmosphere. No. 2,271,406. Benjamin H. Thurman to Refining, Inc.

Composition of matter which comprises, alkali metal soap, a substantial amount of gums recovered from crude vegetable oils, and a substantial amount of at least one alkali metal compound having an alkaline reaction in addition to any alkali present in said gums when recovered from said crude oil, said composition being stable against fermentation. No. 2,271,407. Benjamin H. Thurman to Refining, Inc.

Composition of matter which comprises, alkali metal soap, a substantial amount of gums, recovered from crude vegetable oils, a substantial amount of at least one alkali metal compound having an alkaline reaction in addition to any alkali present in said gums when recovered from said crude oil, and an organic soap solvent miscible with water, said compositio being stable against fermentation. No. 2,271,408. Benjamin H. Thurman to Refining, Inc.

An alkali metal phosphate-phosphatidic composition having high stability and a pH when dispersed in water not substantially greater than 7.8, said compound resulting from reacting a phosphatide with a mixture of alkali metal phosphates, said mixture having substantially less than three alkali metal atoms for each phosphate group. No. 2,271,409. Benjamin H. Thurman to Refining, Inc.

Composition of matter comprising a compound formed by reacting a phosphatide and a solution of an aliphatic hydroxy acid. No. 2,271,-410. Benjamin H. Thurman to Refining, Inc.

Meltable wax-like composition containing from 4-6 per cent. of a powdered resinous rubber derivative, hydrogenated fat melting above 130° F., and upwards of 59 per cent. of a wax, said rubber derivative being the resultant of treating rubber with a halide of an amphoteric metal. No. 2,271,492. William H. Bryce to Dixie Wax Paper Co.

Leather

In process for manufacture of tanning substances with improved fastness to light made by condensing dihydroxydiphenylsulfones, phenolmonosulfonic acids, formaldehyde and urea, the improvement of partly sulfonating the first prepared mixture of a dihydroxydiphenylsulfone and a phenolmonosulfonic acid comprising the two components in the ratio of sulfone to phenol sulfonic acid up to substantially molecularly equal parts with a sulfonating agent in smaller quantity by weight than the used dihydroxydiphenylsulfone and afterwards condensing said sulfonation mixture in weakly acid solution with urea and formaldehyde at a temperature not substantially in excess of 65° C. No. 2,271,245. Robert Biedermann to J. R. Geigy.

Metals, Alloys

Process for quickly and regularly obtaining copper very low in oxygen from oxidized copper by means of successive simultaneous and violent pourings of fluid copper and charcoal, characterized in that the total quota of charcoal necessary for the deoxidizing operation is introduced in successive portions in the form of charcoal pieces, the succession of the introduction of the said portions being regulated so as to correspond to the exhaustion of the action of the preceding portion. No. 2,268,615. Rene Rerrin to Societe d'Electrochimie et des Acieries Electriques d'Ugine.

An electric contacting element containing .05 to 3% tellurium, .25 to 5% cadmium, balance substantially all copper. No. 2,268,938. Franz R. Hensel to P. R. Mallory & Co., Inc.

An electric contactor contact containing .05 to 3% tellurium, balance copper. No. 2,268,939. Franz R. Hensel to P. R. Mallory & Co., Inc.

Electric contacting element containing .05 to 3% tellurium, .1 to 10% of an intermetallic compound selected from the group consisting of the phosphides berylides, silicides and aluminides of chromium zirconium beryllium, titanium, nickel cobalt, iron and manganese and the balance substantially all copper. No. 2,268,940. Franz R. Hansel to P. R. Mallory & Co., Inc.

Addition agent and its use in the treatment of iron and steel. No. 2,269,407. James Critchett and Walter Crafts to Electro Metallurgical Co.

Alloy comprising 75 to 99.5% nickel, .5 to 25% platinum, and manganese in amounts of approximately .5 to 2%. No. 2,269,497. Michel Vilensky to Owens-Corning Fiberglas Corp.

Welding rod for fusion-type welding, characterized by high fluidity and high wetting power in the molten state, and formed from an alloy consisting of; nickel from about ½% to about 10%; phosphorus from about 1/20% to about ½%; tin, if any, up to about 2%; and the balance substantially of copper. No. 2,269,581. Donald Crampton and Henry Burghoff to Chase Brass & Copper Co., Inc.

Process for improving the resistance of a metal to corrosion by a given gaseous substance. No. 2,269,601. Rene Perrin to Societe d'Electrochimie d'Electro-Metallurgie et des Acieries Electriques d'Ugine.

Magnesium base alloys. Nos. 2,270,185 to 2,270,195. John C. McDonald to The Dow Chemical Co.

Process increasing extractable vanadium in vanadium bearing materials which contain as components a member from the group composed of silica and alkaline earth metal compounds which comprises adding an amount of at least one of said components which will bring the temperature of incipient fusion of said material between approximately 1700° to 1900° F., and roasting the resulting material at said temperature of incipient fusion so as to increase the content of vanadium which is extractable by weak acidic solutions or chlorination. No. 2,270,444. Leslie G. Jenness to Vanadium Corp. of America.

Process of separately recovering vanadium and uranium from ores containing the same which also contain compounds of other metals which form oxides in which the metal is trivalent and which contain as a component a member from the group composed of silica and alkaline earth metal compounds which comprises adding an amount of at least one of said components which will bring the temperature of incipient fusion of said ore to approximately 1800° F. roasting the resulting ore at said temperature of incipient fusion so as to increase the content of vanadium which is extractable by weak acidic solutions or chlorination extracting vanadium from said material with a mixture of gases consisting essentially of sulfur dichloride and chlorine and then leaching uranium from said material with a solution of an alkali metal carbonate. No. 2,270,445. Leslie G. Henness to Vanadium Corp. of America.

Ferrous alloy having an analysis including between .75 and 2.00% carbon .40 to 1% manganese, .40 to 3.00% silicon, 5.00 to 30.00% chromium, 5.00 to 15.00% copper and the remainder substantially all iron said alloy being capable of being cast and being characterized by wear resistance and freedom from hot metal scale pickup. No. 2,270,483. Jacob Trantin, Jr.

Process for manufacturing beryllium. No. 2,270,502. John E. Bucher to Antioch College of Yellow Springs.

Method of and apparatus for recovering precious ores. No. 2,270,526. Edwin Keyser and Stanley Prusinski to Stanton Cooper.

Soldering alloy highly resistant against tarnishing consisting of 15% to 35% of palladium, 10% to 25% of gold, 7% to 20% of copper, 5% to 15% of cadmium and the remainder substantially all silver. No. 2,270,594. Josef Leuser to Chemical Marketing Co., Inc.

Process for the production of nickel and cobalt alloys by aluminothermic reduction. No. 2,270,643. Max Stern.

Method of making an ordnance alloy resistant to mercury fulminate which comprises melting copper and beryllium to form a basal alloy thereof forming a cold alloy of aluminum in an amount providing 1% to 20% of the final alloy with mercury in excess of the amount forming a stable amalgam with said aluminum and adding said mercury alloy to said beryllium copper melted at a temperature less than the vaporization temperature of the amalgam but more than the vaporization temperature of free mercury. No. 2,270,660. Charles C. Misfeldt.

Article of manufacture comprising ferrous metal in sheet form and a coating adhering directly to the bare metal said coating comprising as essential film-forming ingredients an intimate mixture of a vinyl resin and a phenol aldehyde resin and being resistant to corrosion flexible tough and sufficiently adherent to the iron to permit fabrication of the coated sheet. No. 2,270,662. Marion H. Raney to Anchor Hocking Glass Corp.

Metallic alloy containing about 3% to about 8% by weight of aluminum; about 0.8% to about 4.4% by weight of silicon and about 0.05% to about 1.0% by weight of zirconium the balance being substantially copper. No. 2,270,716. Alan Morris to Bridgeport Brass Co.

In cold rolling silicon steel strip the step which comprises maintaining the temperature of the steel within the range of 20° C. to —30° C. during the rolling operation. No. 2,270,762. Weston Morrill to General Electric Co.

Alloys of copper-manganese-nickel-silver containing at least 10% of each of manganese and nickel, the ratio of manganese to nickel being not less than 0.5 nor more than 2, from 0.1 to 2.0% silver, and the balance copper, the copper constituting at least 18% of the alloy. No. 2,270,868. Reginald S. Dean and Clarence T. Anderson to Chicago Development Co.

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U. S. Chemical Patents

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In method activating catalytic properties of a porous mass of comminuted metal having extended surfaces of a sulfur sensitive hydrofining metal the step of treating said metal by conveying a wet mixture of nitric acid vapors and a non-poisoning gas to said metal until an even adherent coating of hydrated nitrate of said metal having a substantially uniform depth of at least 10^4 metal nitrate atoms is formed. No. 2,270,874. Marion H. Gwynn.

Alloy steel comprising the following essential elements: carbon about .5% to .85%, molybdenum about 8.5%, chromium about 4% and boron about .3% to .5%; said steel having high speed properties and being characterized by stability against the formation of soft skin at forging and heat treating temperatures in ordinary atmospheres. No. 2,270,979. James H. Taylor to Gorham Tool Co.

Process of silver soldering a metallic diaphragm having a relatively thin wall to a comparatively massive fitting. No. 2,270,987. John E. Woods to Clifford Mfg. Co.

Method producing substantially pure magnesium comprising introducing impure magnesium into direct contact with from 10 to 50 per cent. by weight of a metal selected from the group of metals consisting of lead, tin, calcium bismuth, antimony and silicon, applying heat so as to cause the metals to alloy, continuing the application of heat so as to cause the magnesium to vaporize, and thereafter passing the magnesium vapor through a filter bed of a refractory material selected from the group of refractory materials consisting of the oxides and silicates of the metals located above manganese in the electromotive series of metals. No.2,271,023. Charles E. Nelson to The Dow Chem. Co.

Process of producing a homogeneous magnetic material of substantially constant permeability and low hysteresis losses. No. 2,271,-040. Jacob L. Snoek to Hartford National Bank and Trust Co.

Electrodeposited tin and process of electrodeposition. No. 2,271,209. Max Schlotter to U. S. Steel Co.

Method forming a strong corrosion-resistant joint in zinc-coated iron, which comprises bonding at least two adjacent surfaces of such zinc-coated iron with a fusion deposited aluminum base alloy having melting point below about 1200° F. whereby the zinc coating in the vicinity of the joint so formed is substantially unimpared. Joint comprising at least two adjacent zinc-coated iron members having an unbroken zinc coating, said members being bonded by a fusion deposited aluminum base alloy having a melting point below about 1200° F. No. 2,271,210. Marvin R. Scott to The Linde Air Products Co.

Method of making non-aging steel. No. 2,271,242. Clarence L. Altenburger to Great Lakes Steel Corp.

Process for the conversion of metals and metal alloys in finely divided form for the manufacture of dental amalgams. No.2,271,264. Erich Kaufmann and Wilhelm Truthe to Chemical Marketing Co., Inc.

Weldrod having a dipped coating comparable to extruded coatings and resulting from a mixture of flux and slag-producing materials together with an effective amount of potassium permanganate for the purpose and with the result of promoting crystal growth manifested as a close interwoven system of hair-like fibrous form which extends throughout the mass and fills voids and makes for density, hardness and uniformity, whereby the coating is comparable to extruded coatings in its freedom from flaking and general behavior under the action of the arc. No. 2,271,358. Gilbert Wilkes, Dale S. Rice and George L. Alpaugh to Taylor-Wharton Iron and Steel Co.

Process of coating articles of iron, copper, and alloys of each of them, which process comprises fusing together a mixture of alkali metal compounds including alkali metal phosphate and alkali metal nitrate, the resulting mixture being in the molten state reactive with the metal treated to produce a coating thereon, and subjecting the articles to the action of the molten mass. No. 2,271,374. Cecil J. McKay to Rust Proofing Co. of Canada, Ltd.

Process of treating articles of iron, copper and alloys of each of them, which process comprises fusing together manganese dioxide and a mixture of alkali metal compounds including alkali metal hydroxide and alkali metal carbonate, the resulting mass being in the molten state reactive with the metal treated to produce a surface coating thereon, and subjecting the articles to the action of the molten mass. No. 2,271,375. Cecil J. McKay to Rust Proofing Co. of Canada, Ltd.

Method for recovering copper from copper sludge derived from waste industrial liquors containing lime and cellulose. No. 2,271,482. Franz Hoelkeskamp and Ewald Knehe to American Bemberg Corp.

Paint, Pigments

In process preparing titanium oxide of pigment quality from titaniferous materials, the steps which comprise sulfating the titanium content by treatment with between about 2 moles to about 4 moles of concentrated sulfuric acid, said acid having a concentration of at least 90% dissolving the resulting titanium sulfate in water crystallizing titanyl sulfate therefrom at an elevated temperature gradually heating the titanyl sulfate to calcination temperatures said gradual heating period of the titanyl sulfate covering at least 6 hours and thereafter maintaining calcination temperatures for between about 1 and about 2 hours to produce anhydrous titanium oxide. No. 2,269,139. James E. Booge to E. I. du Pont de Nemours & Co.

Method of manufacturing zinc white pigments. No. 2,269,355. Cornelius Beringer to Cornelius Raymond Beringer, Eugen Horvat, Ernst Horvat, Ferdinand Solt and Alfred Spiegel.

Method of improving the hiding power of a pigment which comprises mixing the pigment in an aqueous slurry with an alkali metal silicate in which the ratio of alkali metal oxide to SiO_2 is less than 5 to 7, and precipitating he silicate by means of aluminum sulfate, the amount of aluminum sulfate being in excess of that required to supply enough acid to satisfy the hydroxyl ions attributable to the alkali metaloxide of the alkali metal silicate, and adding a small amount of a water soluble substance selected from the class consisting of zinc, and alkaline earth metal oxides, hydroxides and salts, and alkali metal oxides and hydroxides in amounts sufficient to effect coagulation of the precipitate. No. 2,269,470. Kenneth Mowlds to The Glidden Co.

Method of making an essentially pure, opaque, white, pigmentary zinc aluminate which consists in making an intimate mixture of zinc oxide and gamma aluminum oxide then heating the mixture in the temperature range 750° C. to 1400° C. until said zinc aluminate is formed. No. 2,269,508. Louis Barton.

Process which comprises subjecting a varnish film to a temperature between about 150° C. and 300° C. in the presence of ultra-violet radiation for a relatively short period of time and subsequently baking the film at a relatively low temperature for a relatively long period of time, thereby obtaining films having a high degree of hardness and toughness. No. 269,751. Robert Barnes to American Cyanamid Co.

Electrochemical method of producing white lead. No. 2,270,783. Gunnard E. Johnson, Reginald G. Bowman and William J. Knox, Jr. to International Smelting & Refining Co.

Method flushing pigment particles from aqueous paste form into a liquid vehicle immiscible with water to release water. No. 2,271,-323. Edward G. Yee to The Sherwin-Williams Co.

Method flushing pigment particles from aqueous paste form into a liquid vehicle immiscible with water to release water. No. 2,271,-324. Edward G. Yee to The Sherwin-Williams Co.

Paper, Pulp

Softening agent for paper comprising an aqueous solution containing 20% by weight of unreacted urea, 10% by weight of glycerine, 10% by weight of talc, and 60% by weight of water. No. 2,268,674. Murray H. Roth to The Richards Chemical Works, Inc.

Petroleum

Process producing more valuable products from a hydrocarbon mixture containing normal butane and isobutane which comprises fractionating the mixture to separate an isobutane fraction and a normal butane fraction subjecting the latter to conversion to produce normally gaseous polymerizable olefins therefrom, subjecting olefins thus formed to polymerization combining resultant olefins polymers with said isobutane fraction and subjecting the mixture to alkylation. No. 2,268,557. Samuel S. Allender to Universal Oil Products Co.

Lubricant comprising an active halogen **in a form normally corrosive** to metals but capable of greatly increasing the load-carrying capacity of the lubricant and also comprising a small amount of an oil-soluble cyclo-aliphatic amine having a pKH value greater than about 7.0. No. 2,268,608. George M. McNulty and John C. Zimmer to Standard Oil Development Co.

Process producing octenes by cross polymerization. No. 2,268,618. Robert Pyzel and Clarence G. Gerhold to Universal Oil Products Co.

Apparatus and process for purifying airplane engine oil. No. 2,268,653. Alan E. Flowers to The De Laval Separator Co.

In process of soil stabilization the improvement comprising adding to an asphalt an amount of solid paraffin wax sufficient to materially increase its water repellency and to give it a wax sufficient to materially increase its water repellency and to give it a wax content of from 2% to 10% and combining the resulting product with water and an aggregate containing clay. No. 2,268,810. Folkert Dijkstra to Shell Development Co.

De-salting and demulsifying compound for treating crude petroleum consisting of a ketone body and a sulfonated body both mutually soluble in water and petroleum. No. 2,269,134. Paul T. Tarnoski and Elwood H. Uhlmann.

Improved petroleum product comprising a refined viscous petroleum fraction normally subject to deterioration under conditions of oxidation and in admixture therewith a minor proportion sufficient to retard said deterioration of the reaction product obtained by reacting an N-substituted dialkyl aromatic amine with a halide of sulfur. No. 2,269,265. Lyle A. Hamilton and Everett W. Fuller and Henry G. Berger to Socony-Vacuum Oil Co.

Mineral oil composition. No. 2,269,282. Robert Moran and Darwin Badertscher, Henry Berger to Socony-Vacuum Oil Co., Inc.

Manufacture of high anti-knock gasoline hydrocarbons, which comprises absorbing propylene in concentrated sulfuric acid of alkylation strength and then treating the mixture with isobutane and a butene in the liquid phase under alkylating conditions effective for the alkylation of said butene by the isobutane whereby the absorbed propylene is also alkylated by the isobutane under these conditions to produce saturated hydrocarbons of high anti-knock value within the gasoline boiling range. No. 2,269,302. Harold Atwell and Frank Bruner to The Texas Co.

Process of converting isobutylene to high molecular weight hydrocarbon resins which comprises introducing the isobutylene into a cold liquid reaction mixture comprising a solvent containing boron trifluoride catalyst wherein the concentration of catalyst is sufficient to produce immediate polymerization of the isobutylene and controlling the rate of introduction of isobutylene to prevent the temperature of the reaction mixture rising substantially above —50° F. No. 2,269,421. Maurice Arveson to Standard Oil Co., Chicago, Ill., a Corp. of Indiana.

In process of removing mercaptan compounds from hydrocarbon oil involving contacting the oil with caustic methanol solution to form mercaptides soluble in said solution, separation of the mercaptide-containing solution from the oil, removal of methanol from the mercaptide-containing solution, and treatment of the resultant solution to decompose the mercaptides and produce an aqueous solution of regenerated caustic soda substantially free of mercaptides, the method of recovering residual methanol from the treated oil which comprises contacting said oil with said aqueous solution of regenerated caustic soda to extract from said oil residual methanol. No. 2,269,467. James McCullough to The Atlantic Refining Company.

Method converting asphaltic hydrocarbon to lubricating oil. No. 2,269,485. Vaino Salmi to Metallytic Corp.

Process for analyzing a core sample comprising the step of flowing a stream of drying air over the sample while the sample is at a temperature of at least 100° C. and sufficient to vaporize moisture therefrom, passing the stream of air through a drying agent to absorb the moisture from the air, weighing the drying agent to determine the moisture absorbed, subsequently increasing the temperature of the sample, while continuing the flow drying air thereover, to a temperature sufficient to remove substantially all the oil from the sample but not substantially above 425° C., and then weighing the treated sample. No. 2,269,569. Milton Williams to Standard Oil Development Co. a corporation of Delaware.

Improved process of neutralizing an acid treated oil of the lubricating type, derived from a petroleum distillate of high neutralization number, which comprises substantially neutralizing the mineral acidity of said oil **without neutralizing** the organic acidity thereof by means of caustic soda solution, treating the partially neutralized

Additional patents on Petroleum, Resins, Plastics and those on Rubber and Textiles for above-mentioned volumes will be given next month.

Abstracts of Foreign Patents

Collected from Original Sources and Edited

Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. We expect to begin reporting German patents in the near future. Your comments and criticisms will be appreciated.

Granted and Published May 20, 1941 (Cont'd from last month).

Vitamin A manufacture by condensing beta-ionylidene-acetaldehyde in the presence of a salt of a secondary base with beta-methyl-crotonaldehyde to epsilon-(beta-ionylidene)-beta-methyl-sorbinaldehyde and reducing the aldehyde group in the latter compound to the alcohol group by means of an aluminum alcoholate. No. 396,704. Winthrop Chemical Co., Inc. (Richard Kuhn and Colin J. R. O. Morris).

Neutral refrigerant solution comprising sodium chloride and sugar, said solution containing between about 10 and 18% salt and between 20 and 36% sugar. No. 396,705. Z Pack Corporation. (Harry A. Noyes).

Pure hydrogen producing apparatus. No. 396,706. Albert Raymond Stryker and Chester Tietig. (Albert R. Stryker).

Aluminum zeolite catalyst useful in the decomposition of nitrosyl chloride to nitric oxide and chlorine. No. 396,715. The Solvay Process Company. (William C. Klingelhoefer, Jr.).

Vat dyestuff of the general formula A-ar-N=N-ar-A in which A stands for an anthraquinonyl radicle and **ar** for an arylene radicle having from one to two non-condensed rings. No. 396,719. Heinrich Neressheimer, Berthold Stein, Ernst Anton, Ernst Honold and Max Schubert.

Vat dyestuff corresponding to the general formula X-ar-N=N-ar-X wherein X represents a para-quinoid polynuclear radicle built up by the adding-on of a six membered ring having only carbon and nitrogen as ring members, to an anthraquinonic nucleus in from two to three adjacent positions and **ar** an arylene ring having up to two non-condensed benzene nuclei the radicle **ar** being combined with the said six-membered nitrogenous ring present in X. No. 396,720. Ernst Honold, Max Schubert, Heinrich Neresheimer, Hans Reich and Berthold Stein.

Vat dyestuff of the general formula A-R-ar-N=N-ar-R-A wherein A represents an anthraquinonic nucleus, R a nitrogenous five-membered ring selected from the group consisting of the triazole, isothiazole and pyrazole rings, two carbon ring members of A and R being common to both, and **ar** an arylene ring having up to two non-condensed benzene rings. No. 396,721. Ernst Honold, Max Schubert, Heinrich Neresheimer, Karl Saftien and Berthold Stein.

Produce gas for industrial use and method for its manufacture. No. 396,722. Karl Koller and Zsigmond Galocsy.

Condensation product containing sulfur made according to the method which comprises causing a compound of the group consisting of carboxylic acids containing at least two carboxyl groups, their esters and anhydrides to act upon a compound of the general formula $HO\text{-}R_1\text{-}Sx\text{-}R_2\text{-}OH$ wherein R_1 and R_2 stand for aliphatic hydrocarbon radicals and **x** stands for one of the numbers 1, 2, and 3. No. 396,726. Adolf Weihe.

Granted and Published May 27, 1941

Lipoid-soluble substance useful for bactericidal agent effective against pathogenic bacteria prepared according to method comprising esterifying flacourtiacea alcohols which essentially consist of chaulmoogryl and hydnocarpyl alcohols with a polybasic inorganic acid of the group consisting of phosphoric and sulfuric acids. No. 396,727. Ozren Stefanovic and Georg Stefanovic.

Hide tanning apparatus. No. 396,733. Charles Kannel.

Water soluble resin producing method comprising reacting cresylic acid with a methylene-containing compound in the presence of an amount of alkali condensing agent equal to not less than 10% NaOH based on the weight of cresylic acid until partial condensation is produced and arresting further reaction by incorporating in the reaction mass an aqueous solution containing an alkali metal dissolved therein equivalent to not less than 6% hydroxide based on the weight of the cresylic acid. No. 396,736. James V. Nevin.

Phenol-terpene resin producing method comprising reacting a phenol, an aldehyde, and a liquid terpene material in any order with the aid of a reactive chloride. No. 396,743. Israel Rosenblum.

Ornamenting aluminum by producing on the metal surface highlighted areas and roughened areas, anodically treating the surface in a brightening electrolyte to brighten said roughened areas, thereafter applying to said surface an artificially produced adherent coating of aluminum oxide. No. 396,754. Aluminum Company of America. (Ralph E. Pettit).

Copper alloy electrode comprising by weight from 96.85 to 98.2% copper from 0.5 to 1% silver, from 1 to 1.75% cobalt and from 0.3 to 0.4% beryllium. No. 396,772. The Beryllium Corporation. (Louis L. Stott).

Hypochlorous acid manufacturing method comprising acidifying a hypochlorite and adjusting the pH value of the solution to less than 7 and above about 4.5. No. 396,774. Buffalo Electro-Chemical Company, Inc. (Hans O. Kauffmann).

Luminous body capable of light emission under excitation comprising a conductive carrier the surface of which is luminescent and comprises a compound of a metal the same as the metal of the carrier. No. 396,776. Canadian General Electric Company Limited. (Wilfried Meyer.)

Refining amines by subjecting a mixture containing primary amines, secondary amines, alcohol, water and ammonia to heating for removing ammonia, reacting at least a part of the remaining mixture with acid which converts the amines to salts, volatilizing alcohol from the amine salts, reconverting the amine salts to amines, and separating the primary amines from other amines. No. 396,782. Canadian Kodak Company, Ltd. (Rudolf L. Hasche and Lee G. Davy).

Fatty acid dehydration by distilling aqueous solutions of lower fatty acids in the presence of withdrawing agents from the group consisting of ketones and ethers for the removal of water, separating the last part of water from the lower aliphatic acid by straight rectification using the same vaporous heat which is thereafter passed to the azeotropic distillation and keeping said withdrawing agent out of the resultant dehydrated fatty acid at all times that it occurs as dehydrated acid. No. 396,783. Canadian Kodak Company, Ltd. (Donald F. Othmer).

Polyvinyl acetal resin stabilization by a process comprising condensing an aldehyde with a polyvinyl fatty acid ester in the presence of a strong mineral acid and less than 5% (based on the weight of the polyvinyl fatty acid ester) of a water-soluble compound selected from the group consisting of $M_2S_2O_4$ and $M_2S_2O_3$, M being selected from the monovalent subgroup of Group I of the periodic table. No. 396,784. Canadian Kodak Company, Ltd. (Donald R. Swan).

Ferrous alloy consisting of 8-16% nickel, 3-6.5% copper, 0.5-10% chromium, 0.5-4% molybdenum, the chromium and molybdenum together being not less than 4%, 0.25-2% manganese, 0.25-3% boron, 1-3% carbon, sulfur not over 0.5%, phosphorus not over 0.5%, silicon 0.5-2.5%, and the balance iron. No. 396,807. Eaton Manufacturing Company. (George Charlton).

Ore flotation apparatus. No. 396,822. Minerals separation North American Corporation. (Christopher R. Ingalls, Carl F. Williams and Lawrence L. Mayer).

Sulfite acid production method for making sulfite acid having a high concentration of free sulfur dioxide. No. 396,832. Paper Patents Company. (Walter H. Swanson, Lloyd Lang and Donald C. Porter).

Luminescent material comprising a crystalline synthetic manganese activated zinc ortho-silicate characterized by the fact that it luminesces under excitation of radiant energy with maximum spectral emission in the region between 5400 A to 5800 A. No. 396,834. Radio Corporation of America. (Humboldt W. Leverenz).

Cracked petroleum distillate product production method comprising refining the distillate to an extent insufficient to cause the distillate to satisfy motor fuel specifications and too mild to lower the bromine number but sufficient to remove therefrom those components which generate high pressures when employed in the subsequent step, reacting the treated cracked petroleum distillate with maleic acid anhydride, removing the unreacted petroleum distillate and maleic acid anhydride, and washing the polymerization product with hot water. No. 396,839. Shell Development Company. (Franz R. Moser).

Asphaltic bitumen having improved adhesive properties produced by adding thereto a lower aliphatic alcohol and sulfuric acid under conditions that will result in the sulfation of the alcohol. No. 396,840. Shell Development Company. (John Philip Pfeiffer).

Polyene carboxylic acid production method, and the products of the general formula ROOC-(-CX=CX)n-COOR wherein R stands for one of the substituents hydrogen and alkyl, one X stands for hydrogen, the other X stands for one of the substituents hydrogen and methyl, and **n** stands for one of the numbers 3 to 7. Winthrop Chemical Co., Inc. (Richard Kuhn and Christoph Grundmann).

Acid resistant material suitable for protecting apparatus for bulk storage of aqueous acetic acid comprising an acetate of cellulose of acetyl value not less than about 58% calculated as acetic acid. No. 396,856. Henry Dreyfus. (Robert W. Moncrief and Alfred Richmond).

Pigment manufacture (precipitated calcium carbonate suitable for coating paper) from the spent digester liquors of paper mills. No. 396,861. The Mead Corporation. (James J. O'Connor).

Carbonaceous ion exchange product comprising material selected from the group consisting of wood, peat, lignite, charcoal, coals and cokes which has been treated with a sufficient quantity of concentrated strong acidic reagent that adds a sulfur-containing acidic radical

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to substantially improve the ion exchange power thereof and which has been charged with alkali as the principal exchangeable ion by subjecting the acid treated material to contact with a solution of an alkali metal salt. No. 396,862. The Permutit Company. (Otto Liebnecht).

Granted and Published June 3, 1941

Butyl esters (normal, secondary and iso-butyl) of alpha, alpha-dimethyl-alpha'-carboxy, dihydro-gamma-pyrone, and process of making them. No. 396,888. Jared H. Ford.

Metal surface protection process comprising priming the surface with a coating composition, at atmospheric temperatures, containing coal-digestion pitch and a solvent, drying the priming coating until substantially all volatile constituents are removed therefrom, and applying in heat liquefied condition to the resultant primed surface a bituminous coating material having a coal-digestion pitch base, said coating material being normally solid at atmospheric temperatures. No. 396,904. The Barrett Company. (Frank W. Yeager).

Paper making and bleaching process. No. 396,906. Buffalo Electro-Chemical Company, Inc. (Hans O. Kauffmann and George M. Wolfe, Jr.).

Hide processing by immersion in an aqueous bath containing sulfuric acid in an amount sufficient to produce pH value between about 4 to 7, thereafter immersing in a solution containing hydrogen peroxide, removing therefrom, and drying the skin or hide. No. 396,907. Buffalo Electro-Chemical Company, Inc. (Erich Hansen).

Wood bleaching process comprising treating the wood with a solution of a peroxide containing pyrophosphate. No. 396,908. Buffalo Electro-Chemical Company, Inc. (Hans O. Kauffmann).

Cotton bleaching process comprising treating the goods with a hypochlorite solution having pH value between about 4.5 and 7 and then incorporating in the goods sufficient peroxide bleaching solution containing a high concentration of peroxide to dampen the goods and permitting the goods to bleach in the damp condition. No. 396,909. Buffalo Electro-Chemical Company, Inc. (Hans O. Kauffmann).

Hydrogen peroxide aluminum container having the interior surface treated with a non-oxidizing acid to etch the same and thereafter placing hydrogen peroxide in the container in contact with said surface. No. 396,910. Buffalo Electro-Chemical Company, Inc. (Max E. Bretschger, Frederick A. Gilbert and Hans O. Kauffmann).

Cellulose derivatives preparation according to method comprising preparing an intimate mixture comprising cellulose, urea and hydrogen peroxide, heating the mixture to reaction temperature, and maintaining such temperature until a product soluble in dilute caustic soda is obtained. No. 396,917. Canadian Industries Limited. (Julian Werner Hill and Ralph Albert Jacobson).

Polymeric material production method comprising heating polyamide-forming reactants at polymerizing temperatures and under superatmospheric pressure in presence of added water in amount sufficient to render the reaction mass fluid during the polymerization reaction. No. 396,918. Canadian Industries Limited. (Edgar W. Spanagel).

Polymeric material exhibiting by X-ray diffraction patterns molecular orientation produced according to method comprising subjecting a fibre-forming synthetic linear polymer to cold working through the application of sufficient compressive stress to cause flow of the solid polymer, the said polymer being one which is capable of being drawn into fibres showing by characteristic X-ray patterns orientation along the fibre axis. No. 396,919. Canadian Industries, Ltd. (John B. Miles, Jr.).

Tanning process comprising subjecting the skin to the action of an interpolymer of members of the acrylic acid series. No. 396,920. Canadian Industries, Ltd. (George DeWitt Graves).

Tanning process comprising subjecting the skin to the action of an aqueous solution of an acidic polymerization product of methacrylic acid at a pH of about 4.8 to 5.7 and then increasing the acidity. No. 396,921. Canadian Industries, Ltd. (George DeWitt Graves).

Modified polymer production method comprising mixing a polymerizable ester of methacrylic acid in substantially monomeric form with 3-14% by weight of alpha terpineol and subjecting the mixture to polymerizing conditions. No. 396,922. Canadian Industries, Ltd. (David A. Fletcher).

Metal production by electrolysis of a fused mixture comprising essentially alkali and alkaline earth metal halides and collecting a liquid alloy of alkali and alkaline earth metals at the cathode. No. 396,923. Canadian Industries, Ltd. (Robert E. Hulse).

Rubber softening method to decrease the resistance to flow of unvulcanized comprising subjecting the rubber to heat in presence of a small amount of a mercapto arylene thiazole. No. 396,924. Canadian Industries, Ltd. (Carroll C. Smith and Ira Williams).

Hydrochloric acid absorption from moist gas containing it. No. 396,925. Canadian Industries, Ltd. (David M. Hurt).

Sulfamic acid preparation method comprising reacting urea with from 20 to 28% oleum to complete the reaction in from 10 to 30 hours at 40 to 50° C., the sulfur trioxide and urea being employed in the molal ratio of 1.25 to 1.8 mols of sulfur trioxide per mol of urea. No. 396,926. Canadian Industries, Ltd. (Martin E. Cuprey).

Secondary alkyl monosulfonates containing 17 carbon atoms. No. 396,928. Canadian Industries, Ltd. (James H. Werntz).

Hexamethylene dithio-carbamic acid compound of the group consisting of salts of hexamethylene dithio-carbamic acid, thiuram sulfides of hexamethylene dithio-carbamic acid and esters of hexamethylene dithio-carbamic acid. No. 396,929. Canadian Industries, Ltd. (Ira Williams).

Reacting alycyclic compound with gaseous mixture of sulfur dioxide and chlorine, and recovering an organic substitution product containing sulfur and oxygen. No. 396,930. Canadian Industries, Limited. (Arthur L. Fox).

Tanning method comprising subjecting the skin to the action of an acidic polymeric material in which the acidity is due to carboxyl groups, and then subjecting the skin to the action of a soluble salt of a metal selected from the group consisting of aluminum, iron, titanium, copper, and chromium. No. 396,931. Canadian Industries, Ltd. (Joseph S. Kirk).

Wood pulp bleaching process comprising contacting the pulp with an alkaline solution containing a peroxide at a temperature within the range 80 to 120° F., the pH during the major portion of the bleaching process being maintained within the range of 10 to 11. No. 396,932. Canadian Industries, Ltd. (Joseph S. Reichert, Samuel A. McNeight and Howard L. Potter).

Tanning method comprising subjecting a skin to the action of an acidic polymeric material in which acidity is due to carboxyl groups attached to aliphatic carbon atoms. No. 396,933. Canadian Industries, Ltd. (Joseph S. Kirk).

Cast iron addition product to facilitate remelting thereof comprising silicon carbide bonded by a cement which has set to form a wet slurry. No. 396,940. The Carborundum Company. (William A. Brown).

Rubber processing for inhibiting deterioration thereof comprising incorporating with the rubber N-methyl N, N'-diphenyl phenylene diamine. No. 396,947. Dominion Rubber Company, Limited. (William F. Tuley and Philip T. Paul).

Plastic composition comprising a water insoluble cellulose ether and as a plasticizer therefor a xenyl phosphate. No. 396,949. The Dow Chemical Company. (Edgar C. Britton and Shailer L. Bass).

Insecticide composition containing as an essential ingredient the isobutylamide of 10, 11-undecylenic acid. No. 396,950. E. I. du Pont de Nemours & Co., Inc. (Euclid W. Bousquet).

Plastic composition comprising a substantially non-volatile, chlorine-containing resin subject to deterioration on exposure to heat or light and, as a preventive of such deterioration a non-volatile, film forming, polymeric, basic amino-nitrogen-containing, chlorine free substance soluble in organic solvents. No. 396,951. E. I. du Pont de Nemours & Co., Inc. (Ellsworth K. Ellingboe and Paul L. Salzberg).

Olefine esterification process comprising bringing an olefin and a saturated aliphatic monocarboxylic acid in the vapor phase in contact with a heteropoly acid catalyst at a temperature within the range of 150-350° C. and at pressure between 10 and 500 atmospheres. No. 396,952. E. I. du Pont de Nemours & Co., Inc. (Wilbur A. Lazier).

Oxalic acid and other acids manufactured by the method comprising heating at superatmospheric pressure carbonaceous material together with at least ten times its weight of water and an added oxygen-containing gas in the presence of a substance, in an amount greater than the weight of the carbonaceous material, of the class which consists of the oxides and hydroxides of the alkali and alkaline earth metals. No. 396,961. Imperial Chemical Industries, Limited. (Fred Davison Leicester).

Alkali metal brine treatment by electrolysis to recover alkali metal at a mercury electrode. No. 396,972. The Mathieson Alkali Works. (Maurice C. Taylor and William C. Gardiner).

Gold alloy comprising 33-84% gold, 10.7-67% copper, 0.1-5% cobalt, 2-10% silver, and 2-10% zinc. No. 396,973. Metals & Controls Corporation. (Arthur W. Peterson).

Sodium aluminate manufacturing process. No. 396,981. The Pennsylvania Salt Manufacturing Company. (Richard L. Davies).

Filled paper comprising fibrous material and alkaline filler in intimate association therewith, and the product derived from the bringing together of materials comprising sizing material and a substantially water soluble copper compound in the presence of water. No. 396,991. Raffold International Corporation. (Joseph E. Plumstead).

Olefine polymerization process for producing higher boiling hydrocarbons from olefines. No. 396,994. Shell Development Company. (Richard Z. Moravec, William T. Schelling and Charles F. Oldershaw.)

Nitrosyl Chloride gas cooling and drying process. No. 396,996. The Solvay Process Company. (Frank O. Agel.)

Nitrosyl Chloride decomposition reaction. No. 396,997. The Solvay Process Company. (Herman A. Beekhuis, Jr.)

Nitrosyl Chloride drying process. No. 396,998. The Solvay Process Company. (Herman A. Beekhuis, Jr.)

Metal Nitrate and chlorine production method. No. 396,999. The Solvay Process Company. (Herman A. Beekhuis, Jr.)

Paper Manufacture method comprising forming a paper web containing alkaline filler and a mordant, and then applying thereto as a surface size a size composition characterized by containing an ammonium resinate and resin regenerated therefrom, thereby forming an alkaline filled sized paper sheet. No. 397,009. S. D. Warren Company. (Arthur Reilly.)

Butadiene Polymerization Product comprising the polymerization products of 1:3 butadiene copolymerized with allyl methacrylate. No. 397,010. Wingfoot Corporation. (Albert M. Clifford.)

Summary of War Regulations

There are no more important subjects to the chemical industry today than priorities, allocations, import and price controls. Chemical Industries, therefore, chronologically digests the important regulations up to Jan. 2, 1942.

Next month these will be brought up to date and each month thereafter.

By way of explanation a "P" order identifies a limited blanket rating given to a company, or an industry to facilitate the acquisition of scarce materials needed by such companies for defense or essential civilian production.

Distribution of commodities under industry-wide control generally is governed by "M" (material) orders, regulating distribution and flow of a given material into defense or essential civilian production channels.

Limits on the production of materials are covered by "L" limitation orders.

Acetic Acid

Sept. 25, 1941. Price Schedule No. 31, effective Sept. 29, 1941, sets prices as shown in table.

Acetic Acid
Price Schedule No. 31

Effective Sept. 29, 1941

I. Acetic Acid in Tank Cars:
The following maximum prices are established for glacial acetic acid (99.5% or over), and for weaker acetic acid of commercial grade in terms of 100% acid content:
Wood Orfgin—
$7.25 per 100 pounds delivered**
Other Origin—
$6.25 per 100 pounds delivered

II. Acetic Acid in Containers, Carload Lots.
A. The following maximum prices, f. o. b. producers' shipping points, are established for concentration of technical and pure acetic acid, of any origin, for carload quantities, in barrels or drums:

Technical***	
28%	$3.18 per 100 lbs.
56%	5.18 " " "
70%	6.19 " " "
80%	6.91 " " "
84%	7.20 " " "
Glacial	8.45 " " "

** Freight in excess of 32c per 100 pounds may be charged to buyer.

Pure***	
30%	$4.23 per 100 lbs.
36%	4.61 " " "
60%	7.17 " " "
80%	8.70 " " "
U. S. Pharmacopoeia	10.25 " " "
Chemically Pure	13.50 " " "

*** Specifically designated percentages include all approximations thereof.

B. Maximum prices, for carload quantities, in carboys and cases, are determined by adding a diifferential of 50c per 100 lbs. to the maximum prices established, in subparagraph A of this paragraph.

III. Acetic Acid in Containers, Less Carload Lots
Maximum prices, for less than carload quantities, in the containers listed below, are determined by adding the following differentials to the maximum prices established in subparagraph A of paragraph II hereof.
For barrels or drums, less carload—
25c per 100 lbs.
For carboys and cases, less carload—
75c per 100 lbs.

Acetic Acid
Price Schedule No. 31

Effective Sept. 29, 1941

1335.210 Appendix A—Maximum Prices for Acetic Acid

(A) Eastern and Western Territory

(1) Tank cars.

The maximum price of $6.93 per hundred pounds f. o. b. works, in tank cars is established for glacial acetic acid (99.5 per cent or over) and for weaker acetic acid of commercial grade in terms of 100 per cent content in Eastern and Western territory.

(B) Eastern Territory.

The following maximum prices are established for concentrations of technical and pure acetic acid of any origin, f. o. b. seller's shipping point in Eastern territory.

(1)) CARLOAD LOTS

(1) Barrels and drums—	Per hundred pounds.
Technical: 1/	
28 per cent	$3.38
56 per cent	5.58
70 per cent	6.68
80 per cent	7.47
84s per cent	7.79
Glacial	9.15
Pure: 1/	
30 per cent	4.44
36 per cent	4.86
60 per cent	7.60
80 per cent	9.26
United States Pharmacopoeia	10.95
Chemically Pure	14.20

(II) Carboys and Cases
Maximum prices established in subdivision (I) of this subparagraph (1) plus 50c per hundred pounds.
(2) Less than carload lots.
(I) Barrels and drums.
Maximum prices established in subparagraph (1), subdivision (1) of this paragraph (B) plus 25c per hundred pounds.
(II) Carboys and cases.
Maximum prices established in subparagraph (1), subdivision (1) of this paragraph (B) plus 75c per hundred pounds.

(C) Western Territory

The following maximum prices are established for concentrations of technical and pure acetic acid of any origin, f. o. b. seller's warehouse in Western territory:

As Amended Jan. 2, 1942

(1) CARLOAD LOTS

(1) Barrels and drums—	Per hundred pounds.
Technical: 1/	
56 per cent	$7.29
60 per cent	7.69
80 per cent	9.20
Glacial	11.05
Pure: 1/	
56 per cent	8.88
60 per cent	9.07
80 per cent	11.00
Glacial	16.00

(II) Carboys and Cases
Maximum prices established in subdivision (I) of this subparagraph (1) plus 50c per 100 pounds.
(2) Less than carload lots.
(I) Barrels and drums.
Maximum prices established in subparagraph (1), subdivision (1) of this paragraph (C) plus 25c per hundred pounds.

(II) CARBOYS AND CASES

Maximum prices established in subparagraph (1), subdivision (I) of this paragraph (C) plus 75c per 100 pounds.
(D) Export Sales.
Maximum prices for acetic acid of any origin on export sales to persons in foreign countries other than Canada or Mexico are as follows:
(1) 3,000 pounds or more but less than 5,000 pounds.
Maximum prices established in subparagraph (2) of paragraph (B) or subparagraph (2) of paragraph (C), whichever the case may be) plus 3c per hundred pounds.
(2) 5,000 pounds or more but less than 25,000 pounds.
Maximum prices established in subparagraph (2) of paragraph (B) or subparagraph (2) of paragraph (C), (whichever the case may be) plus 1½c per hundred puonds.
(3) 25,000 pounds or more.
Maximum prices established in subparagraph (2) of paragraph (B) or subparragraph (2) of paragraph (C), whichever the may be) plus 1½c per hundred pounds.
(E) Containers.
For acetic acid sold in containers, a reasonable charge for such containers may be added to the maximum prices established by paragraphs (B), (C) and (D).
1. Specifically designated percentages include all approximations thereof.

Jan. 2, 1942. Price Schedule No. 31 revised.

Acetone

Oct. 21, 1941. Price Schedule No. 36, effective Oct. 27, 1941, establishes ceiling prices as shown in table.

Dec. 20, 1941. Price ceilings raised to facilitate greater output from corn, higher priced raw materials.

Aluminum

General Preference orders M-1, M-1-a; M-1-b; M-1-c; M-1 Ext.; P-12, Schedule No. 2, Amended as of Nov. 1; Suspension Order No. 1.

Feb. 24, 1941. Aluminum metal put under mandatory priority. Six weeks inventory supply held adequate. Producers instructed to apply A-2 preference rating to all defense orders, effective March 22.

Feb. 28, 1941. Priorities Division instructs producers to give British defense requirements equal standing with U. S. Army and Navy orders. Aircraft manufacturers permitted to release mixed scrap to secondary smelters.

March 3, 1941. Ceiling of 11 cents per lb. set on mixed aluminum scrap sold by plane manufacturers.

March 22, 1941. Automatic preference rating of A-10 substituted for A-2 rat-

Acetone
Price Schedule No. 36

Effective Oct. 27, 1941

The following maximum prices are established for acetone:
(a) Eastern territory (**).
Tank cars, 7c per pound, delivered.
Drums, car-load lots, 8½c per pound delivered, containers included.
Drums, less than car-load lots, 9c per pound delivered, containers included.
(b) Western territory (**).
The maximum prices established for acetone in Western territory are the maximum prices established in paragraph (a) for acetone in Eastern territory, plus ½c per pound.

(**)—When used in this schedule the term "Eastern" territory shall mean the States of New Mexica, Colorado, Wyoming, Montana and all States east thereof, and the term "Western" territory shall mean all other States of the United States.

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War Regulations
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ing applied to defense orders in Feb. 24 instructions, including British orders. B-class of orders established, whereby users are to receive percentages of 1940 shipments.

March 24, 1941. Price Division issued ceiling Schedule No. 2 for aluminum scrap and secondary ingot pegged to price of virgin metal. Prices fixed f. o. b. point of shipment, allowance made for spread between maker and dealer prices.

Aluminum Scrap
Price Schedule No. 2

REVISED AS OF JUNE 2, 1941
ALUMINUM SCRAP SCHEDULE
(F. O. B. Point of Shipment)

Grade of Aluminum Scrap —	Maximum price (per pound) carload shipments Sale by Maker.	Sale by Dealer.
Pure clips and cable ..	13c	14½c
Segregated alloy sheet clips	12	13½
Old sheet and utensils ..	11	12½
Mixed sheet clips	11	12½
Cast scrap and forged scrap old and new, clean and dry	11	12
Borings and turnings other than No. 12, clean and dry	10	11½
No. 12 type borings and turnings, clean and dry	9½	11
Pistons free of struts, clean and dry	11½	12½
Pistons with struts, clean and dry	9½	10½

Each grade shall include all types and qualities of scrap falling within the broad category named. However, the maximum prices are applicable to scrap which meets generally accepted maximum standards in the trade—as, for instance, the classifications of the National Association of Waste Materials Dealers, Inc., contained in its Circular O, effective June 1, 1940. Scrap which fails to meet such standards should be sold at prices less than the maximum.

Note: Aluminum foil and light gauge aluminum which does not exceed .006 of an inch in thickness shall not be subject to this price schedule.

SECONDARY ALUMINUM INGOT
(F. O. B. Point of Shipment)

Grade of Secondary Aluminum Ingot—	Maximum *Price.
98 P. C. pure aluminum ingot....	17c
Silicon alloys	17
Deoxidizing aluminum: Notch bar, granulated ingot or shot (2c extra allowed for special shapes)	16½
Piston alloys	16½
No. 12 aluminum	16

* Per pound on quantities of 30,000 pounds or more.

On quantities of—

10,000 to 30,000 pounds	¼c per pound	
1,000 to 10,000 pounds	½c per pound	
Less than 1,000 pounds	1c per pound	

—may be added to maximum price.

April 18, 1941. Index issued clarifying orders which fall in non-military (or B-class) groups.

May 5, 1941. Amendments to Price Schedule No. 2 issued by OPACS put into effect lowering maximum price at which makers of scrap may sell old aluminum sheet and aluminum utensils from 12 to 11 cents a lb.

May 20, 1941. Priority order M-1, extended to Dec. 31, 1941.

Acetone
Price Schedule No. 36

Effective Oct. 27, 1941
As Amended Jan. 1, 1942

§ 1335.310 APPENDIX A, maximum prices for acetone.—The following maximum prices are established for acetone whether produced synthetically or from the fermentation of molasses, corn or other raw material.

(a) Eastern Territory.*

	Per pound delivered
Tank cars	\$.158
Drums, car-load lots	.168
Drums, less than car-load lots ..	.173

In the case of acetone produced from the fermentation of molasses, the above maximum prices apply where the cost of the molasses used for such production is \$2.50 per hundred pounds of sugar content, delivered to the plant of the producer. For each increase or a decrease of \$.10 in such cost, the maximum prices for such acetone shall be the above maximum prices plus or minus \$.004.

(b) Western Territory.* The maximum prices established for acetone in Western Territory are the maximum prices established in Paragraph (a) for acetone in Eastern Territory plus ½c per pound.

(c) Maximum prices for acetone delivered from local stocks.

The maximum price for acetone delivered from local stocks maintained by others than producers shall be the maximum prices established by paragraphs (a) or (b) above, whichever the case may be, plus \$.01 per pound.

(d) Containers.

For acetone sold in containers, a reasonable charge for such containers may be added to the maximum prices established by paragraphs (a), (b) and (c) above.

* When used in this Appendix the term "Eastern" territory means the States of New Mexico, Colorado, Wyoming and Montana and all States east thereof and the term "Western" territory means all other States of the United States.

June 2, 1941. Price schedule No. 2 for aluminum scrap and secondary aluminum ingot was amended as follows: special secondary aluminum alloys removed from that part of the schedule relating to secondary aluminum ingot; price regulation removed from certain grades of scrap produced by the aircraft industries, segregated as to alloy, and returned to supplier of the original material for reconversion; quantity differentials for aluminum scrap have been removed but continue on secondary aluminum ingot sold in less than 30,000-pound lots; aluminum foil and light gauge sheet not more than .006 of an inch in thickness removed from schedule.

June 10, 1941. Supplementary order M-1-c brings aluminum scrap under full priority control.

June 26, 1941. A-10 preference rating (P-12) assigned for aluminum scrap.

June 28, 1941. A-10 priority rating given secondary aluminum smelters engaged in defense business to buy aluminum scrap for processing. Transfer of scrap between dealers not affected.

Aug. 14, 1941. Price Schedule No. 2 on scrap amended to permit manufacturers using certain forms of wrought aluminum to make more uniform arrangements for reconversion of their scrap into finished material. Low fee can be charged for all types of wrought scrap, other than forging scrap, provided such wrought scrap is segregated as to alloy and delivered to a processor for reconversion. Toll agreement must be approved by Director of Priorities.

Aug. 21, 1941. Agreement reached to reduce price of ingot aluminum from 17 cents to 15 cents per lb. on all shipments made after Sept. 30, 1941. Prices for fabricated aluminum to be cut at least 2 cents and in some cases more.

Oct. 1, 1941. As of November 1 maximum prices of aluminum scrap and secondary aluminum ingot will be reduced.

Oct. 15, 1941. Price Schedule No. 2 amended, effective Nov. 1, to provide reductions of 1 to 3 cents per lb. in ceiling prices for aluminum scrap and secondary aluminum ingot and premiums for scrap shipments in quantity.

Aluminum Scrap
Price Schedule No. 2

Effective March 24, 1941
Amended Nov 1, 1941
(F. O. B. Point of Shipment)

*Grade of Aluminum Scrap—	†Maximum Prices (Per pound) I	II	III
Pure clips and cable ..	10	11	11½
Alloy sheet clips, mixed or segregated	8½	9½	10
Old sheet and utensils	9½	10½	11
Cast scrap and forged scrap, old and new ..	10	10½	11
Borings and turnings, including No. 12	7	8	8½
Pistons free of struts ..	10	10½	11
Pistons with struts	8	8½	9

† I. Maximum price in lots of less than 1,000 pounds.
II. Maximum price in lots of 1,000 to 20,000 pounds (if shipped by truck) or 1,000 to minimum carload (if shipped by rail).
III. Maximum price in lots of 20,000 pounds or more (if shipped by truck) or minimum carload (if shipped by rail).
* These prices apply to scrap which is clean and dry, and which otherwise meets generally accepted maximum standards of the trade. Scrap which fails to meet such standards should be sold at prices below the above ceilings at least in proportion to the content of moisture and other foreign matter.

Grade of Secondary Aluminum Ingot	(A)
98 per cent pure aluminum ingot ..	15
Silicon alloys	15
Piston alloys	14½
No. 12 aluminum	14½
Deoxidizing aluminum	13½
	(B)
10,000 to 30,000 pounds	¼
1,000 to 10,000 pounds	½
Less than 1,000 pounds	1

(A) Maximum price per pound on quantities of 30,000 pounds or more.
(B) May be added to the maximum price per pound.

Oct. 16, 1941. Suspension Order No. 1 forbids aluminum operations of Central Pattern & Foundry Co., Chicago, until March 31, 1942; except that stocks on hand may be used to complete defense orders already booked.

Nov. 18, 1941. Preference Rating Order P-19-b gives A-1-b rating for acquisition of materials needed in construction of aluminum plant at Massena, N. Y.

Dec. 31, 1941. Priority orders on aluminum and aluminum scrap extended one month to Jan. 31 by O.P.M. Supplementary orders to be designated M-1-d and M-1-e being prepared to revise existing controls over production and consumption.

Ammonium Sulfate

May 26, 1941. Producers and distributors of ammonium sulfate for fertilizer purposes asked by OPACS to continue prices unchanged. Ceiling warning issued.

Antimony

May 1, 1941. Priorities Division in General Metals Order No. 1 establishes control over consumers' stocks to prevent excess inventory accumulation.

Aug. 22, 1941. Price advance of ½ cent a lb., announced on Aug. 21, cancelled.

Sept. 23, 1941. General Metals Order No. 1 revoked. Inventory control continues under Priority Regulation No. 1.

Dec. 21, 1941. Priority aid to smelters and refiners in acquisition of maintenance and operating supplies. Preference Order P-73 supplements P-56 in assuring complete cycle of domestic metals production.

Dec. 27, 1941. Imports are put under Government control by General Imports Order M-63. Contracts for import will be handled by RFC. No private arrangements for import may be made. Existing channels of brokers and dealers may be male. Existing channels of brokers and dealers may be used by RFC.

Bleaching Powder

Dec. 19, 1941. Prices stabilized by agreements with producers. Maximum prices set for 1942 deliveries, with temporary ceilings 25 cents per 100 lbs. higher than 1941.

Borax, Boric Acid

June 9, 1941. Full priority control to meet temporary shortage threatened by strike. OPACS issues civilian allocation program for borax and boric acid in connection with priorities division preference order.

July 3, 1941. Borax and boric acid allocation program extended from July 5 to July 30.

July 30, 1941. Priority control extended to August 30. Expiration date of allocation program extended to Aug. 31.

Brass

July 21, 1941. Price Schedule No. 12 put into effect for brass mill scrap.

Brass Mill Scrap

Maximum Price Schedule No.12

Effective July 21, 1941

(Per Pound, F. O. B. Point of Shipment)

Kind of grade of scrap—	Heavy scrap	Rod ends	Turnings
Commercial bronze:			
Containing 95% or more copper	9½c	9¼c	8¾c
Containing minimum of 90% up to 95% copper	9⅜c	9⅛c	8⅝c
Red brass:			
Containing minimum of 80% copper	9⅛c	8⅞c	8⅜c
Best quality brass:			
Containing minimum of 71% up to 80% copper	8¾c	8½c	...
			Rod turn'gs
Yellow brass	8⅝c	8⅜c	7⅞c

Quantity Differentials

Premium on shipments of:

15,000 lbs. or more at one time.. ⅝c

40,000 lbs. or more at one time.. 1c

Other Kinds of Scrap

All other kinds or grades of brass mill scrap except nickel silver scrap and cupronickel alloy scrap, should be sold at normal differentials from principal kinds or grades. Nickel silver scrap and cupro-nickel alloy scrap should be sold in accordance with Price Schedule No. 8, which establishes maximum prices for scrap and secondary materials containing nickel.

Maximum prices apply to scrap clean, dry and free from foreign materials. Scrap which fails to meet such standards should be sold at normal differentials below the maximum prices.

A lot of 15,000 pounds may be made up of any kind or grade of heavy scrap, or of any kind or grade of turnings and rod ends, but heavy scrap may not be mixed with either turnings or rod ends or both, to make up a lot of 15,000 pounds. A lot of 40,000 pounds may be made up of any kind or grade of brass mill scrap.

Sept. 11, 1941. Lead pencil makers agree with OPM to cut down on use of brass, with possible annual saving of 350,000 lbs.

Oct. 2, 1941. Several amendments to Price Schedule No. 12 issued.

Dec. 29, 1941. Amendment to Price Schedule 12 permits resale of brass mill scrap at or below ceiling paid plus actual duty paid.

Jan. 2, 1942. Specific maximum prices covering brass and bronze alloy ingots submitted to producers for approval by OPA.

General preference order M-9-a extended for two weeks.

Conservation order M-9-c interpreted.

Butyl Alcohol

Oct. 21, 1941. Price schedule No. 37 effective October 27, 1941, sets ceiling prices.

Dec. 20, 1941. Ceiling increased to facilitate production from corn, high priced raw material.

Brass Mill Scrap

Price Schedule No. 12

Effective July 21, 1941
Amended October 3, 1941

(Per Pound, F. O. B. Point of Shipment)

Kind of grade of scrap—	Heavy scrap	Rod ends	Turnings
Commercial bronze:			
Containing 95% or more copper	9½c	9¼c	8¾c
Containing minimum of 90% up to 95% copper	9⅜c	9⅛c	8⅝c
Red brass:			
Containing minimum of 80% copper	9⅛c	8⅞c	8⅜c
Best quality brass:			
Containing minimum of 71% up to 80% copper	8¾c	8½c	...
			Rod tgs.
Yellow brass	8⅝c	8⅜c	7⅞c
Copper	10¼c	10¼c	9½c
			Turnings
Nickel silver:			
5% nickel	9¼c	9c	4⅝c
10% nickel	10⅛c	9⅞c	5$\frac{1}{16}$c
15% nickel	10⅞c	10⅝c	5$\frac{7}{16}$c

Quantity Differentials

Premium on shipments of:

15,000 lbs. or more at one time.... ⅝c

40,000 lbs. or more at one time.... 1c

A lot of 15,000 pounds may be made up of any kind or grade of heavy scrap, or of any kind or grade of turnings and rod ends, but heavy scrap may not be mixed with either turnings or rod ends or both, to make up a lot of 15,000 pounds. A lot of 40,000 pounds for the purposes of this schedule may be made up of any kind or grade of brass mill scrap.

Other Kinds of Scrap

All other kinds or grades of brass mill scrap,, except cupro-nickel alloy scrap, should be sold at normal differentials from principal kinds or grades. Cupro-nickel alloy scrap should be sold in accordance with Price Schedule No. 8, which establishes maximum prices for scrap and secondary materials containing nickel.

Maximum prices apply to scrap clean, dry and free from foreign materials and which meets generally accepted maximum standards in the trade. Scrap which fails to meet such standards should be sold at normal differentials below the maximum prices.

If delivery is made by truck a shipment in lots of 15,000 pounds or 40,000 pounds or more as the case may be, will be considered to have been made "at one time," for the purposes of this schedule, if such lot is delivered to the buyer within two days after the first shipment of the lot is so delivered.

Cadmium

April 11, 1941. OPACS issues price warning.

Aug. 28, 1941. OPA and producers agree to maintain top price of 90 cents per lb. for sticks and 95 cents per lb. for anodes in sales to users. Sales to

Butyl Alcohol

Price Schedule No. 37

Effective Oct. 27, 1941

The following maximum prices are established for normal butyl alcohol:

(A) Eastern territory.**

Tank cars, 10¾c per pound delivered.

Drums, carload lots, 11¾c per pound delivered, containers included.

Drums, less than carload lots, 12c per pound delivered, containers included.

(B) Western territory.**

Maximum prices established for normal butyl alcohol in Western territory are the maximum prices established in paragraph (A) for normal butyl alcohol in Eastern territory plus ½c per pound.

** When used in this schedule, the term "Eastern" territory shall mean the States of New Mexico, Colorado, Wyoming and Montana and the States east thereof and the term "Western" territory shall mean all other States of the United States.

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Butyl Alcohol

Price Schedule No. 37

Effective Oct. 27, 1941

As Amended Jan. 1, 1942

1335.360 APPENDIX A—MAXIMUM PRICES FOR NORMAL BUTYL ALCOHOL.

The following maximum prices are established for normal butyl alcohol whether produced synthetically or from the fermentation of molasses. corn or other raw material:

(a) Eastern Territory 1/

Tank cars, $.158 per pound. delivered.

Drums, carload lots. $.168 per pound, delivered.

Drums, less than carload lots, $.173 per pound delivered.

In the case of normal butyl alcohol produced from the fermentation of molasses, the above maximum prices apply where the cost of the molasses used for such production is $2.50 per hundred pounds of sugar content, delivered to the plant of the producer. For each increase or a decrease of $.10 in such cost, the maximum prices for such normal butyl alcohol shall be the above maximum prices plus or minus $.004.

(b) Western Territory 1/

The maximum prices established for normal butyl alcohol in Western Territory are the maximum prices established in paragraph (a) for normal butyl alcohol in Eastern Territory plus ½c per pound.

(c) Maximum Prices for Normal Butyl Alcohol Delivered From Local Stocks

The maximum prices for normal butyl alcohol delivered from local stocks maintained by others than producers shall be the maximum prices established by paragraphs (a) or (b) above, whichever the case may be, plus $.01 per pound.

(d) Containers.

For normal butyl alcohol sold in containers, a reasonable charge for such containers may be added to the maximum prices established by paragraphs (a) (b) and (c) above.

dealers to be at discounts in order to permit resales to customers at agreed prices.

Sept. 23, 1941. General Metals Order No. 1 revoked. Inventory control continues under Priority Regulation No. 1.

Dec. 27, 1941. Imports are put under Government control by General Imports Order M-63. Contracts for import will be handled by RFC. No private arrangements for imports may be made. Existing channels of brokers and dealers may be used by RFC.

Calcium—Silicon

July 29, 1941. Calcium-Silicon defined as commercial product containing calcium and silicon in following proportions, Ca from 28 to 35%; Si, 60 to 65%. Defense orders must be accepted in preference to other contracts or purchase orders.

Any person who obtains delivery must use such material, or an equivalent amount, for purposes specified in connection with issuance of the rating.

No producer shall make deliveries unless authorized by the Director of Priorities, and no person shall be entitled to receive such material unless he shall have filed before the 25th of the preceding month Form PD-72.

The Director of Priorities each calendar month will allocate deliveries of Calcium-Silicon on basis of information received on Form PD-72 which must be filed by all persons entitled to receive deliveries.

Nov. 29, 1941. Order M-20-a replaces M-20 and extends control to May 31, 1942. Monthly reports by users required.

Carbon Black

June 23, 1941. Meeting of major producers and distributors called by OPACS to prevent 12½ per cent price increase scheduled for 3rd quarter.

Dec. 17, 1941. To meet cost increases and reduce revenue from export sales, producers are granted price increase of a little over 5 per cent.

Cellophane

Nov. 8, 1941. Limitation Order L-20 discontinues use of cellophane and similar transparent materials derived from cellulose for certain purposes. Order effective immediately but existing stocks may be consumed under certain conditions. Banned uses include packaging or manufacture of razor blades, cosmetics, soap, textiles, rubber and products, hardware, metals and sporting goods, paper and products, laundry, candles and wax products, electric equipment (except manufacture), decorations and novelties, molded Christmas bells, molded flower pot covers, bows and rosettes, flowers, wreaths and garlands, soda straws, ribbons, household rolls and gift wrappings. Suppliers orders to notify customers.

Dec. 2, 1941. Toilet Goods Association, Inc., advised by OPA that in opinion of OPM cosmetics and soaps wrapped in cellophane or packaged with use of cellophane may not be shipped after Jan. 8, 1942 without special notice.

Chlorinated Rubber

Oct. 29, 1941. General Preference Order M-46 effective Nov. 1, 1941 places all chlorinated rubber under full priority control. Supply and distribution is to be completely controlled by Director of Priorities with Priorities Regulation No. 1 applicable.

Chlorinated Solvents

Oct. 15, 1941. General Preference Order M-41 places all stocks of chlorinated solvents under priority control

Chlorine

July 26, 1941. Full priority control established for all producers of gaseous and liquid chlorine.

July 30, 1941. Seven essential public services and industries given first civilian preference by OPA, they are: water purification, sewage treatment, sanitation, refrigerant gases for existing equipment, slime control in industrial plants, preparation of products for medicinal use, preservation of and processing of food products.

Sept. 21, 1941. OPM Materials Branch orders pulp and paper manufacturers to limit consumption of chlorine in bleaching rag stock to 80 per cent of amount used in first half of 1941, and to 70 per cent in semi-bleached grades.

Nov. 15, 1941. Limitations order L-11 restricts use of chlorine in pulp, paper, paperboard manufacture, newsprint excepted. Brightness ceilings established, ranging from 4 point cut in best rag paper to 100 per cent cut in ground wood. Bleaching eliminated in most bags, sacks and wrapping paper. The order is not applicable to stocks on hand. Regulations set up on quarterly basis with various percentages fixed for use of chlorine compared with three-month period ended July 31, 1941.

Dec. 20, 1941. Amendment to General Preference Order M-19, effective after Feb. 1, 1942 provides direct allocation of chlorine.

Chromium

May 1, 1941. Priorities Division establishes General Metals Order No. 1 to prevent inventory accumulation by controlling consumers' stocks.

July 7, 1941. Priority control imposed and metal removed from General Metals Order No. 1 (M-18).

Order applies to all processors, dealers, producers, and purchasers of chromium defined as: (1) Ores or concentrates containing chromium; (2) the element chromium, ferro-chromium and other combinations with other elements in semi-manufactured or unmanfactured form, prepared for consumption in the manufacture of steel; (3) all chemical combinations having chromium as an essential and recognizable component; (4) refractory bricks or refractory material of chromium; (5) all scrap or secondary material containing chromium.

Aug. 22, 1941. Amendment to July 7 preference order as follows: (1) definition of processor clarified; (2) defense order defined; (3) restrictions of use of chromium in making chemicals clarified; (4) provision requiring acceptance of defense orders included; (5) provision included for relief in cases where defense orders have been unreasonably rejected or deliveries deferred.

Nov. 26, 1941. Preference Order M-18-a effective Nov. 29, puts full control of deliveries in hands of Director

of Priorities. Monthly requests for chromium must be made to producers. Aggregate chromium oxide content of chemicals is limited in each month to one-twelfth of amount of ore used in chemicals actually delivered in year ended June 30.

Dec. 19, 1941. Chromium, one of eight metals, used for alloying purposes brought under control by M-21-a to supplement regulations in effect on Far Eastern commodities. Alloy steel containing these elements may not be sold after Jan. 1, except to fill defense orders.

Dec. 27, 1941. Imports of chromium, one of thirteen materials, goes under Government control (General Imports Order M-63). All contracts for imports will be handled by the RFC. No private arrangements for imports may be made. Existing channels of brokers and dealers are to be used by RFC. Supplementary Order M-21-d restricts civilian use of high grade chromium steel. For first 10 days chrome steel use is limited to one-third of amount used in December, 1940. After 10 days, use is banned except for defense orders.

Cobalt

Nov. 3, 1941. General Preference Order M-39 places cobalt under direct allocations system. Full control given Director of Priorities. Deliveries of cobalt compounds for non-metallic uses limited to 90 per cent of average monthly weight delivered in first half of 1941.

Dec. 6, 1941. Order M-39 amended to relieve users of less than 50 lbs. a month of necessity of filling monthly reports.

Dec. 19, 1941. Cobalt one of eight metals brought under control by M-21-a to supplement regulations in effect on Far Eastern commodities. Alloy steel containing same may not be sold after Jan. 1 except to fill defense orders.

Dec. 20, 1941. Priority aid to smelters and refiners in acquisition of maintenance and operating supplies. Preference Order P-73 supplements P-56 in assuring complete cycle of domestic metals production.

Copper

April 25, 1941. Office of Price Administration and Civilian Supply announces goal of uniform 12-cent copper price. Following temporary maximum prices suggested: Primary copper, 12c. Custom smelters, 12½c. Casting copper, 12¼c. Red leaded brass, 13c.

May 29, 1941. Copper placed under mandatory priority control. OPM issues civilian allocation program. All defense orders given A-10 rating or higher. Refiners are required to set aside reserve pool equal to 20 per cent of April, 1941 production. Remaining copper to be procated among customers. Priorities Division to allocate copper held by Metal Reserve Co. The order provides for inventory control but removes copper from General Metals Order No. 1.

June 10, 1941. Priority orders amended as follows: (1) refiners to calculate pool on basis of 20 per cent of April production of duty-free copper; (2) refiners may make full shipment in any month in which customers' total purchases are not more than one minimum carload load; (3) persons who are parties to toll agreements for copper need not file full copies of such agreements, and need not obtain specific permission for new agreements.

July 9, 1941. Priority orders amended to include copper-base alloys and copper products including brass and bronze. Defense orders with rating of A-10 must be filed before civilian orders. Products covered by order may be shipped to non-defense customers only after defense orders have been provided for. Fabricators must use all available metal before being granted allocation from pool.

July 19, 1941. Copper-base alloys removed from General Metals Order No. 1. Inventory control is included in priority order.

Aug. 2, 1941. Amendment to priority order provides that no deliveries of refined copper can be made except with specific directions of the Office of Production Management. Dealers and fabricators to receive allocation certificates from Priorities Division. Manufacturers who customarily buy from dealers exempted. All defense orders must be accepted and given priority over other business.

Aug. 5, 1941. Price Schedule No. 15 sets ceiling based on 12c price. Maximum prices for copper scrap to be set later. OPA recommends that RFC purchase high-cost copper at prices above 12c. Plan for high-cost copper open only to presently operating qualified domestic producers. Contracts between refiners and purchasers entered into before Aug. 5, 1941 at not more than 12½c may be completed if the contract is not disturbed by allocations under the OPM preference order

Aug. 12, 1941. Metals Reserve Co. to purchase high-cost copper in excess of 12c ceiling, exempted from order. 12c price is for electrolytic, delivered Connecticut Valley base. Application to be made to OPA to carry out contracts entered into prior to Aug. 12 calling for delivery at above-ceiling quotations.

Copper
Price Schedule No. 15

Effective Aug. 12, 1941

Connecticut Valley Base Prices Per Lb.

Grade	
Electrolytic, Lake or other fire refined copper made to meet the American Society of Testing Materials Standard, B5-27, for electrolytic copper or B4-27 for Lake copper, delivered at Connecticut Valley points	12c
Casting copper made by fire refining to a standard of 99.5 per cent pure, including silver as copper, f. o. b. refinery	11¾c

The maximum prices fixed above are for copper in the shape of wire bars or ingot bars in carload lots.

DIFFERENTIALS

(1) For Other Kinds, Grades, Shapes or Forms

For copper of any other kind, grade, shape or form there shall be added to or subtracted from the Connecticut Valley base price the customary premiums or discounts for such kind, grade, shape or form which the seller would have added to or subtracted from the Connecticut Valley base price on August 11, 1941.

(2) For Deliveries at Points Other Than Connecticut Valley Points

For deliveries at any point other than a Connecticut Valley point there shall be added to or subtracted from the Connecticut Valley base price the customary differential which the seller would, on August 11, 1941, have added to or subtracted from the Connecticut Valley base price adjusted for the kind, grade, shape or form differential.

(3) For Less Than Carload Lots

For less than a carload lot the maximum price shall be f. o. b. shipping point and shall be calculated by adding to the Connecticut Valley base price adjusted for the kind, grade, shape, form and delivery differentials the following **premiums:**

Quantity—	Price per lb.
0—499 pounds	2c
500—999 pounds	1½c
1,000—4,999 pounds	1c
5,000—pounds to carload	¾c

The above prices for less than a carload lot shall not apply to a sale, delivery, or transfer by the refiner or producer of copper.

A refiner or producer of copper shall be permitted to sell less than carload lots at a delivered price not more than ½c per pound above the Connecticut Valley base price adjusted for the kind, grade, shape, form and delivery differentials.

Aug. 28, 1941. Price Schedule No. 15 amended to specify that the same delivery differentials are to apply to lake copper as are provided for electrolytic. Casting copper placed on an f. o. b. refinery basis, instead of delivered Connecticut Valley. Text changed to permit dealers to apply to OPA for permission to complete less-than-carload sales at above ceiling prices, where the copper was purchased in carload lots prior to July 1 but delivered after that date. On application to OPA certain firm commitments beyond Dec. 31 can be completed.

Oct. 14, 1941. Preference Order P-61 gives about 150 refiners, ingot makers, and other remelters of copper scrap and copper-base alloy scrap with large defense orders assistance of A-10 rating to secure scrap.

Four Latin-American copper producers given high ratings to obtain maintenance equipment and operating supplies.

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A-3 may be used for orders where delivery after October 1 is called for, A-1-b for orders placed before Jan. 1 for delivery before July 1.

Oct. 21, 1941. Conservation Order M-9-c bans use of copper in about 108 civilian products in seven industrial classifications after Jan. 1, 1942. Use is restricted to 60 per cent of a 1940 base period for rest of 1941. Use in building construction forbidden after Nov. 1. Use in all items not specified reduced to 70 per cent of a 1940 base period. Order applies to any metal containing 50 per cent copper.

Oct. 21, 1941. Using formula of OPA, high-cost Michigan producers to sell to the procurement Division of the Treasury at higher-than-ceiling-prices.

Nov. 3, 1941. Number of clarifying changes made in Order M-9-c.

Nov. 5, 1941. Manufacturers of copper wire and cable asked that 15 prices be not exceeded. Manufacturers asked to inform OPA of all changes in prices or terms of sale since Jan. 1, 1940.

Nov. 12, 1941. Special form PD-167 to be filed in cases where Order M-9-c has caused special hardships.

Dec. 5, 1941. Public hearings on copper situation to be started by OPM on SPAB order.

Dec. 6, 1941. SPAB announces REA to receive 1,500 a month up to total of 10,500.

Dec. 8, 1941. Copper Order M-9-c amended to permit manufacturers of copper and copper alloy products to use, to limited extent, inventories of partially fabricated metal until March 31, 1942. New List B makes specific exemptions for certain uses.

Dec, 19, 1941. Copper, one of eight metals, used for alloying purposes brought under control by M-21-a. Alloy steel containing same may not be sold after Jan. 1, 1942, except to fill defense orders.

Dec. 20, 1941. Priority aid given to smelters and refiners of copper and several other metals in acquiring operating and maintenance supplies. Preference Order P-73 assures complete cycle of domestic metals production from mining through refining.

Dec. 27, 1941. General Imports Order M-63 places imports under Government control. All contracts for imports will be handled by RFC. No private arrangements for imports may be made.

Cotton Linters

Aug. 20, 1941. Full Priority Control. General Preference Order M-12 prohibits sale of second-cut cotton linters or more than 20 per cent of mill-run linters, for any purpose other than ultimate use in the chemical industry. Requires all cottonseed oil crushing mills using two cuts in the production of cotton linters to regulate processes so that first cut cotton linters will not be more than 20 per cent of the total cut. Permission must be obtained from Director of Priorities for delivery of cotton linters in accordance with contract entered into prior to July 31. Cottonseed crushing mills producing cotton linters and purchasers of second cut and mill-run cotton linters are required to keep accurate records and file monthly reports.

Sept. 10, 1941. Order M-12 extended to July 31, 1942.

Nov. 5, 1941. Order M-12 amended. Further restrictions on cotton linters. Priorities Regulation No. 1 made applicable. No deliveries of second cuts may be made except to plants engaged in chemical industry. Use restricted to production of purified cotton linter pulp. Order M-12 is amended subjecting cotton linters to additional regulations. Small sale of chemical grade cotton linters at 1.65 cents per lb. above the 3.35 cents per lb. ceiling price cancelled and rebilled at the 3.35 level.

Cottonseed Oil

(See also Fats and Oils)

June 27, 1941. OPACS announces ceiling will be placed below current market as result of speculative price advances.

Aug. 28, 1941. OPACS withdraws statement on price ceiling but warns that ceiling will be set if price structure gets out of line. Schedule 25 gives rules for elimination of speculation.

Aug. 29, 1941. Schedule No. 25 clarified.

Ethyl Alcohol

Aug. 28, 1941. General Preference Order M-30 establishes full priority control effective Aug. 28 to Nov. 30. Existing Defense orders assigned ratings and must be filled in preference to others. "Ethyl Alcohol" means ethyl alcohol from whatever source derived, having a proof of 160 degrees or more, and shall include tax paid and denatured alcohol produced in industrial alcohol plants classified as such under Regulations No. 3 of the Bureau of Industrial Alcohol of the U. S. Treasury Depart-

Copper Restriction Order M-9-C

Issued October 20, 1941

Following is "List A," items in which use of copper is restricted by conservation order M-9-C.:

Automotive, trailer and tractor equipment; garage and automotive repair equipment; headlamp and headlamp parts; heaters, horns, hub and gas tank caps; miscellaneous fittings and trim mouldings, rear view mirrors and hardware.

Building Supplies and Hardware

Aid conditioning equipment (except small, moving parts and bearings); blinds, including fixture fittings and trimmings; builders' finish hardware; conduits and tubing; decorative hardware—including house numbers; door knockers, checks, pulls and stops, doors, door and window frames, sills and parts; elevators and escalators, except bearings; gravel stops and snow guards.

Also grilles, gutters, leaders, down spouts and expansion joints; incinerator hardware and fittings, letter boxes and mail chutes; lightning rods (except for electric power stations and industrial stacks); lighting fixtures; ornamental metal work; pile butt protection; plumbing and heating supplies.

Also, bands on pipe covering; convectors and local heaters; fixture fittings and trimmings (excluding valve seats); hot water heaters, tanks and coils (except as provided in defense housing critical list issued by Director of Priorities, September 12, 1941, as the same may be amended).

Also, pipe and fittings (except as provided in defense housing critical list issued by Director of Priorities, September 12, 1941, as the same may be amended); shower rods, heads and pans; sinks and drainboards; toilet floats, cistern and low water floats, towel racks.

Also, push, kick, switch, floor and all other device plates; roofing and flashing; screening and screens; screws, nuts, bolts and hooks; shelves; stair and threshold treads; termite shields, terazzo strips, reglets and mouldings; ventilators and skylights; water containers for humidification; weather stripping and insulation.

Burial Equipment

Burial vaults; casket hardware; caskets; memorial tablets; morticians' supplies.

Dress Accessories

Buckles; buttons; dress ornaments; handbag fittings; metal cloths.

House Furnishings and Equipment (Including Office and Institutional)

Andirons, screens and fireplace fittings; candlesticks; cooking and table utensils; curtain fasteners, rods and rings; cuspidors, furniture, furniture hardware. Also household appliances, fans, heaters, stoves and ranges, lamp standards, shades, shade holders and stems; trays, upholsterers' supplies, including nails and tacks; vases, pitchers, bowls and artcraft; waste baskets, hat trees, humidors and similar items.

Jewelry, Gifts and Novelties

All jewelry, gifts and novelties, including: Advertising specialties; atomizers—except medical; bar fittings; book ends; cosmetic containers; lighters; napkin rings; picture frames; smokers' accessories; souvenirs.

Miscellaneous

All plating primarily for decorative purposes; barrel hoops; beauty parlor equipment and barber shop supplies; beverage dispensing units and parts thereof; bicycles, motorcycles and similar vehicles: boxes, cans, jars and other containers; branding, marking and labeling devices, and stock for same; chimes and bells.

Also fire extinguishers; fire fighting apparatus and hydrants (all decorative and all non-functional parts); fire hose, couplings and fittings (except brass expansion joints and valve trim); keys and locks (except barrels); ladders and hoist including fittings; lanterns and lamps.

Also live stock and poultry equipment; luggage fittings; match and pattern plates, matrices and flasks; name, identification and medal plates; non-operating or decorative uses or parts of installations and mechanical equipment, including frames, bases, standards and supports.

Also paint (except for ship bottoms); photographic equipment and supplies; pleasure boat fittings, hardware and motors; pole line hardware; powder and paste; radios; reflectors saddlery, hardware and harness fittings.

Also signs, including street signs; slot game and vending machines; stationery supplies; desk accessories; office supplies; pencils; pens and penholders; statues; sundials; toy; valve handle; weathervanes.

ment under Sections 3070 to 3124 inclusive of the Internal Revenue Code.

"Related Compounds" means acetic acid, acetic anhydride, acetone, ethyl ether, ethyl acetate, butyl alcohol, butyl acetate, isopropyl alcohol and isopropyl acetate from whatever sources derived.

Sept. 17, 1941. Price Schedule No. 28, effective Sept. 15, established. Places top price at 24½ cents a gallon at works for specially denatured 2B. Schedule gives basis formula covering 12 classifications in tank car lots in Eastern territory, with differentials set up for eleven other classifications.

Ethyl Alcohol

Price Schedule No. 28

Effective Sept. 15, 1941

The following maximum prices are established for ethyl alcohol (188-190 proof unless otherwise indicated) of the formulae listed below:

(Per Gallon)

a. Tank cars in Eastern territory:

CD12, f. o. b. shipping point	.325
CD13, f. o. b. shipping point	.325
CD14, f. o. b. shipping point	.325
SDI, at works	.275
SD2B, at works	.245
SD3A, at works	.275
SD12A, at works	.255
SD23A, at works	.275
SD23G, at works	.305
SD23H, at works	.280
Proprietary name CDA, f. o. b. shipping point	.325
Proprietary name solvent, at works	.285

b. To determine the price for quantities of less than tank cars, the following differentials may be added to the maximum tank car prices set forth in Paragraph a above, containers included:

Drums CL	$.07
19 Drums—LCL	.09½
1-18 Drums	.12½
Barrels CL	.11
19 Barrels	.13
1-18 Barrels	.16

c. To determine the maximum prices in the Pacific territory. 4c per gallon may be added to the maximum prices established in Paragraph a, or b above, as the case may be.

d. To determine the price on anhydrous ethyl alcohol (200 proof), 3c per gallon may be added to the maximum prices established in Paragraphs a, b or c above, as the case may be.

e. For purposes of this schedule the term "Eastern" territory shall be deemed to include all the States east of and including New Mexico, Colorado, Wyoming, and Montana and the term "Western" territory shall be deemed to include all other States of the United States.

Dec. 1, 1941. General Preference Order M-30 extended indefinitely.

Dec. 20, 1941. Price schedule ceilings increased to provide for greater output from corn, a high priced raw material. New price levels contained in amendments effective Jan. 1, 1942.

Explosives

Dec. 12, 1941. A-8 rating given industrial explosives manufacturers by P-86 for production and packaging materials. Form PD-82 must be used for requests.

Dec. 31, 1941. Manufacturers warned to adhere exactly to provisions of Conservation Order M-9-c.

Jan. 2, 1942. OPA has submitted specific maximum prices covering over 95 per cent of all brass and bronze alloy ingots to producers for individual approval. The new prices are intended to become effective Feb. 1, 1942.

General Preference Order M-9-a extended for two weeks pending completion of extensive revision.

Interpretation order to M-9-c covers use of copper in radios.

Ethyl Alcohol

Price Schedule No. 28

Effective Sept. 15, 1941
As Amended Dec. 18, 1941

1335.159. APPENDIX A.

Maximum Ethyl Alcohol Prices

The following maximum prices are established for ethyl alcohol (188-199 proof unless otherwise indicated) of the formulae listed below whether produced synthetically or from the fermentation of molasses, corn or other raw material:

(a) Eastern territory.

(1) Tank cars:	Per wine gallon (231 cubic inches).	
CP12	$0.58	f.o.b. shipping point
CD13	0.58	f.o.b. shipping point
CD14	0.58	f.o.b. shipping point
SD1	0.53	at works
SD2B	0.50	at works
SD3A	0.53	at works
SD12A	0.51	at works
SD23A	0.53	at works
SD23G	0.56	at works
SD23H	0.535	at works
Proprietary name CDA	0.58	f.o.b. shipping point
Proprietaryy name solvent	0.54	at works

In the case of ethyl alcohol produced from the fermentation of molasses, the above maximum prices apply where the cost of the molasses used for such production is $2.47 per hundred pounds of sugar content delivered to the plant of the producer. For each increase or decrease of $0.10 in such cost, the maximum prices for such ethyl alcohol shall be the above maximum prices plus or minus $0.015.

(2) Less than tank car quantities.—For quantities of less than tank cars the following differentials, plus a reasonable charge for containers, may be added to the maximum prices established in subparagraph (1) above.

	Per wine gal. (231 cub. in.)
Drums or barrels, C.L.	$0.035
Drums or barrels, LCL, 19 or more	.06
Drums or barrels, LCL, 1-18	.09

(b) Western territory—4 cents per gallon may be added to the maximum prices established by subparagraphs (1) or (2) above, as the case may be.

(c) Anhydrous ethyl alcohol (200 proof) —3 cents per gallon may be added to the maximum prices established by Paragraph (a) or (b) above, as the case may be.

(d) When used in this Appendix, the term "Eastern" territory shall mean the States of New Mexico, Colorado, Wyoming, and Montana, and all States east thereof; the term ""Western" territory shall mean all other States of the United States.

Fats and Oils

Aug. 28, 1941. Price Schedule No. 25 established to eliminate speculative and inflationary price practices.

Oct. 14, 1941. Price Schedule No. 25 to be amended. Will allow price guarantees on unshipped balance of bookings to extend thirty days from date of sale, will eliminate cancellation of shortening bookings, and will provide that quantities booked be taken out within thirty days from date of order unless special application is made under the hardship clause.

Dec. 12, 1941. Ceiling prices imposed on all fats and oils except butter. Sale of spot or future raw, crude, or refined fats and oils including lard and cottonseed oil, is forbidden at prices above those prevailing on Nov. 26, 1941. All stages of distribution, except retail, covered by order. Processed or finished fats and oils products, such as shortening and salad oil are not covered. Essential oils, mineral oils and chemical oils are also excluded.

Dec. 29, 1941. Priority control, M-71 puts fats and oils under priority control. Order prohibits deliveries to all manufacturers which would bring inventories over 90 days operating supply. Essential oils, small manufacturers and imports exempted. Order is effective until Jan. 31, when a new order is to be issued.

Dec. 31, 1941. Price Schedule revised, raises level by a minimum of 11 per cent through shift of base period from Nov. 6, 1941 to Oct. 1, 1941.

Formaldehyde

Aug. 20, 1941. OPA establishes Price Schedule No. 21. Sets prices ranging from 4.25 to 9.5 cents per lb., f. o. b. five major shipping points, with freight equalization. Does not apply to sales in containers of less than 45 lbs. Dealers and distributors selling from local stocks allowed 1 cent per lb. premium. Affirmation of compliance with regulations is required.

Aug. 21, 1941. Formaldehyde paraformaldehyde, hexamethylenetetramine, and synthetic resins made from them placed under full priority control.

Aug. 29, 1941. Preference Order M-25 amended as follows: (1) Defense orders given rating of A-10 or higher and must be given preference over all others; (2) Defense orders must be accepted even if previously accepted orders have to be deferred; (3) Use is practically stopped for certain lists of non-essential articles; (4) After all defense orders are met producers of synthetic resins must fill orders for purposes listed in Classification 1. Rating of B-4 is given to resins used in this classification which include such essential public services as heat, light, power, and water equipment; oil well equipment; industrial, food and medicinal containers; material and equipment for scientific research, etc.; (5) A rating of B-8 is assigned to Classification 2, which includes equipment such as kitchenware, radios, household appliances, passenger automobiles and commercial photographic equipment; (6) A preference rating of B-4 was assigned for the deliveries of the three chemicals for all non-defense, non-plastic uses.

Nov. 17, 1941. Preference order M-35 amended. Radio tube bases placed un-

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der Classification 1 of permitted uses. B-4 rating assigned for deliveries of resins for these purposes. B-8 ratings assigned for deliveries of synthetic resin molding powder to radio manufacturers in amounts necessary to produce molded cabinets for existing chassis inventories.

Formaldehyde

Price Schedule No. 21

Effective Aug. 20, 1941

Price per pound f. o. b. New York, N. Y.; West Haverstraw, N. J.; Garfield, N. J.; Perth Amboy, N. J., or Tallant, Okla.; freight equalized.

I. SHIPPED FROM PRODUCER'S SHIPPING POINTS

Quantity in pounds and containers	Cents: Carload lots	Cents: Less-than Carload lots
Tank cars (70,000-72,000 lbs.)	.0425	....
Tank, truck or wagon	....	.0450
Drums (475 lbs.)	.0540	.0590
Barrels (450 lbs.)	.0575	.0625
Kegs (225 lbs.)	.0675	.0725
Half barrel (225 lbs.)	.0675	.0725
Barrels (200 lbs.)	....	.0725
Kegs (125 lbs.)	.0700	.0750
Kegs (90 lbs.)	.0750	.0800
Carboys (45 lbs.)	.0700	.0750
Carboys (100 lbs.)	.0600	.0650
Kegs (60 lbs.)	.0800	.0850
Drums (45 lbs.)	....	.0850
Kegs (45 lbs.)	.0900	.0950

The maximum price which a purchaser may pay under this schedule for formaldehyde shipped to him from a producer's shipping point shall not exceed the maximum price set forth above plus freight to destination from New York, N. Y.; West Haverstraw, N. Y.; Garfield, N. J.; Perth Amboy, N. J., or Tallant, Okla., whichever is less.

In no case shall the price of any quantity of formaldehyde sold in containers holding 45 pounds or more, but not listed above, exceed the maximum price set forth above for a container holding the next greater quantity.

II. DELIVERED FROM LOCAL STOCKS

The maximum price for formaldehyde delivered from local stocks maintained at points other than producers' shipping points shall not exceed a price ex-seller's warehouse greater than the maximum prices set forth above plus freight to seller's warehouse from New York, N. Y.; West Haverstraw, N. Y.; Garfield, N. J.; Perth Amboy, N. J.; or Tallant, Oklahoma, whichever is less, plus 1c per pound.

Glycerine

Oct. 28, 1941. Price ceiling set by Price Schedule No. 38, effective Nov. 10, 1941. Base maximum prices set at 11½ cents a lb. for crude glycerine (80% glycerol) and 18 cents a lb. for refined. Schedule covers sales in containers of 500 lbs. or more and applies to deliveries in all parts of the U. S. except certain parts of Oregon and Washington, Nevada, Arizona, New Mexico, part of Colorado, Utah, Wyoming (excluding Laramie County), Idaho and Montana. This area is designated as Zone B and for deliveries of glycerine therein a premium of 2 cents a lb. may be charged.

Dec. 10, 1941. Glycerine industry asked to stop shipments except for following: direct defense, hospital and medicinal use, prevention of shutdown in civilian plant. Report on glycerine stocks of 80 per cent or more requested.

Fats and Oils

Price Schedule No. 53

Effective Dec. 13, 1941 — As Amended Jan. 2, 1942

1351.151 Maximum Prices for Fats and Oils.

(A) On and after December 13, 1941, no person shall sell, offer to sell, deliver, or transfer fats or oils at prices higher than maximum prices, except that contracts entered into prior to December 13, 1941, providing for a higher price than the maximum prices may be carried out at the contract price. The maximum price shall include commissions and all other charges.

(B) For any kind, grade or quality of fat or oil the maximum price shall be the highest price at which the seller sold such kind of fat or oil of the same grade and quality in a similar amount to a similar purchaser on October 1, 1941, for delivery within sixty days: Provided, that in determining maximum prices for soybean oil and for linseed oil, three-fourths of 1c per pound shall be added to such October 1, 1941, price.

(2) If the maximum price cannot be determined under subsection (B) (1), the maximum price shall be the highest price at which the seller sold the same kind of fat or oil of a different grade or quality or in a different amount or to a different type of purchaser on October 1, 1941, for delivery within sixty days, making the necessary adjustments for differences in grade, quality, amount or type of purchaser in accordance with the seller's practice for determining price differentials existing on October 1, 1941: Provided that in determining the maximum prices for soybean oil and for linseed oil, three-fourths of 1c per pound shall be added to such October 1, 1941, price.

(3) If the maximum price cannot be determined under either subsection (B) (1) or (B) (2), the maximum price shall be the price at which such kind of fat or oil of the same grade and quality in a similar amount to a similar purchaser was sold in the locality of the seller's shipping point on October 1, 1941 for delivery within sixty days. Provided, that in determining the maximum prices for soybean oil and for linseed oil, three-fourths of 1c per pound shall be added to such October 1, 1941, price.

(4) If the maximum price determined under the above subsections is less than 111 per cent of the price at which the same kind of fat or oil of the same grade and quality was sold by the seller or was sold in the locality of the seller's shipping point in a similar amount and to a similar purchaser on November 26, 1941, for delivery within sixty days, the maximum price shall be 111 per cent of such November 26 price.

(C) The above prices shall be the maximum prices for all transactions except for cottonseed oil futures contracts traded on the New York Produce Exchange and on the New Orleans Cotton Exchange and lard futures contracts traded on the Chicago Board of Trade. For such contracts the maximum prices on each exchange shall be the closing bid prices on such exchanges as of October 1, 1941.

(D) The maximum prices for both domestic and imported fats and oils determined under subsection (B) shall include at least the same absorption of transportation and other charges as were or would have been absorbed by the seller of comparable shipments to the same place of destination on October 1, 1941.

(E) Maximum prices established by this schedule for fats and oils shipped into or out of the United States by ocean transportation shall include charges prevailing on October 1, 1941, for freight, war risk insurance, and marine insurance connected with such transportation. Increases in such charges may be added and decreases in such charges shall be subtracted from the maximum prices established by this schedule.*

*Sections 1351.151 to 1351.158, inclusive, issued pursuant to the authority contained in executive orders Nos. 8734, 8875, 6 F. R. 1917, 4483.

1351.151A. Exempt Sales. Sales of fats and oils products in the finished form, sales of refined fats and oils (except olive oil) through wholesale and retail channels and directly to the baking, restaurant, hotel and other cooking trades, and sale of lards destined for human consumption without further processing are exempt from operation of this schedule.*

Glycerine

Price Schedule No. 38

Effective Nov. 10, 1941

The following maximum prices are established for glycerine.

(A) REFINED GLYCERINE.

(1) C. P. glycerine (98 per cent glycerol).
(I) Tank cars, .18½ per pd. dld.
(II) Drums, car-load lots, .18¾ per pd. dld.
(III) Drums, less than car-load lots, .10¼ per pd. dld.

(2) C. P. glycerine (U. S. P. 95 per cent glycerol).
(I) Tank cars, .18 per pd. dld.
(II) Drums, car-load lots, 18¼ per pd. dld.
(III) Drums, less than car-load lots, .18¾ per pd. dld.

(3) Dynamite.
(1) Tank cars, 18 pd. dld.
(II) Drums, car-load lots, .18¼ per pd. dld.
(III) Drums, less than car-load lots, .18¾ per pd. dld.

(4) High gravity.
(I) Tank cars, $.18 per pd. dld.
(II) Drugs, car-load lots, .18¼ per pd. dld.
(III) Drums, less than carload lots, .18¾ per pd. dld.

(5) Yellow distilled.
(I) Tank cars, $.18 per pd. dld.
(II) Drugs, car-load lots, .18¼ per pd. dld.
(III) Drums, less than car-load lots, .18¾ per pd. dld.

The above prices established for refined glycerine in this paragraph (A) are applicable to deliveries in zones A and C. For deliveries of refined glycerine in zone B, the maximum price shall be the maximum price for deliveries in zones A and C plus 2c pound.

(B) CRUDE GLYCERINE

(I) Soap lye (basis 80 per cent glycerol).
(1) Tank cars, $.11½ per pd. dld.
(II) Drums, car-load lots, .11½ per pd. .11½ per pd. dld.
(III) Drums, less than car-load lots, dld.

(2) Saponification (basis 88 per cent glycerol) to refiners.
(I) Tank cars, $.12¾ per pd. dld.
(II) Drums, car-load lots. 0.12¾ per pd. dld.
(III) Drums, less than carload lots, .12¾ per pd. dld.

(3) Saponification (basis 88 per cent glycerol) for individual uses.
(I) Tank cars, $.12¾ per pd. f. o. b. point of manufacture.
(II) Drums, car-load lots, .13¾ per pd. f. o. b. point of manufacture.
(III) Drums, less than car-load lots, .14¾ per pd. f. o. b. point of manufacture.

(4) Crude glycerine of glycerol percentages other than those listed above.

Maximum prices of crude glycerine, of glycerol percentages other than those listed above, in tank cars and drums (car-load lots and less-than-carload lots), shall be determined at the rate of 11½c per pound delivered for glycerine of 80 per cent glycerol content.

(c) When used in this schedule the term

(1) Zone "A" means:

All points east of and including North Dakota, South Dakota, Nebraska, Kansas, Omaha, Texas; Laramie County, Wyoming; Colorado, east of but not including the following counties: Jackson, Grand Gilpin, Jefferson, Douglas, Teller, Fremont, Custer, Huerfano, Costilla.

(2) Zone "B" means:

The territory between zone A and zone C, as follows: Washington, east of and including the following counties: Okanogan, Chelan, Kittitas, Yakima, Klickitat; Oregon, east of and including the following counties: Hood River, Wasco, Jefferson, Deschutes, Klamatch; Nevada, Arizona, New Mexico, that part of Colorado west of and including those counties mentioned above; Utah, Wyoming, excepting Laramie County, Idaho, Montana.

(3) Zone "C" means:

The territory west of zone "B."

Dec. 19, 1941. Price Schedule No. 38 amended to aid refiners in securing crude from manufacturers. Difference in freight charges between refinery nearest to crude source and refinery further away may be added to delivered maximum prices.

May 1, 1941. Priorities Division establishes control over consumers' stocks under General Metals Order No. 1 to prevent excess inventories.

Sept. 23, 1941. General Metals Order No. 1 revoked. Inventory control continued under Priority Regulation No. 1.

Glycerine

Price Schedule No. 38

Effective Nov. 10, 1941 As Amended Dec. 18, 1941

1335.410 Appendix A—Maximum Prices for Glycerine.

The following maximum prices are established for glycerine:

(A) Refined Glycerine

(1) C. P. Glycerine (98 per cent glycerol).

(I) Tank cars, $.18½ per lb. dld.

(II) Drums, car-load lots, .18¾ per pd. dld.

(III) Drums, less than car-load lots, .19¼ per pd. dld.

(2) C. P. Glycerine (U. S. P. 95 per cent Glycerol).

(I) Tank cars, $.18 per pd. dld.

(II) Drums, car-load lots, .18¼ per pd. dld.

(III) Drums, less than car-load lots, .18¾ per pd. dld.

(3) Dynamite

(I) Tank cars, $.18 per pd. dld.

(II) Drums, car-load lots, .18¼ per pd. dld.

(III) Drums, less than car-load lots, .18¾ per pd. dld.

(4) High Gravity

(I) Tank cars, $.18 per pd. dld.

(II) Drums, car-load lots, .18¼ per pd. dld.

(III) Drums, less than car-load lots, .18¾ per pd. dld.

(5) Yellow Distilled

(I) Tank cars, $.18 per pd. dld.

(II) Drums, car-load lots, .18¼ per pd. dld.

(III) Drums, less than car-load lots, .18¾ per pd. dld.

The above prices established for refined glycerine in this paragraph (A) are applicable to deliveries in zones A and C. For deliveries of refined glycerine in zone B, price for deliveries in zones A and C, plus the maximum price shall be the maximum 2c per pound.

(B) Crude Glycerine.

(1) Soap lye (basis 80 per cent glycerol).

(I) Tank cars, $.11½ per pd. dld.

(II) Drums, car-load lots, .11½ per pd. dld.

(III) Drums,, less than car-load lots, .11½ per pd. dld.

(2) Saponification (basis 88 per cent glycerol) to refiners.

(I) Tank cars, $.12¾ per pd. dld.

(II) Drums, car-load lots, .12¾ per pd. dld.

(III) Drums, less than car-load lots, .12¾ per pd. dld.

(3) Saponification (basis 88 per cent glycerol) for individual users.

(I) Tank cars, $.12¾ per pd. f. o. b. point of manufacture.

(II) Drums, car-load lots, .13¾ per pd. f. o. b. point of manufacture.

(III) Drums, less than car-load lots, .14¾ per pd. f. o. b. point of manufacture.

(4) Crude glycerine of glycerol percentages other than those listed above.

Maximum prices for crude glycerine of any glycerol percentages other than those listed above, shall be the maximum prices set forth above for the respective grade, use and quantity, increased or decreased in proportion to the increase or decrease in the percentage of glycerol content.

(C) Excess Freight

Where the transportation charge on a shipment of crude glycerine from point of manufacture to point of refining exceeds the transportation charge which would be applicable on the same shipment from the same point of manufacture by the same mode of transportation to another point of refining, the amount of such excess may be added to the delivered prices set forth in paragraph (B) above. Such excess shall be shown as a separate item in all records and invoices.

(c) When used in this schedule the term

(1) Zone "A" means:

All points east of and including North Dakota, South Dakota, Nebraska, Kansas, Omaha, Texas; Laramie County, Wyoming; Colorado, east of but not including the following counties: Jackson, Grand Gilpin, Jefferson, Douglas, Teller, Fremont, Custer, Huerfano, Costilla.

(2) Zone "B"" means:

The territory between zone A and zone C, as follows: Washington, east of and including the following counties: Okanogan, Chelan, Kittitas, Yakima, Klickitat; Oregon, east of and including the following counties: Hood River, Wasco, Jefferson. Deschutes, Klamatch; Nevada, Arizona, New Mexico, that part of Colorado west of and including those counties mentioned above; Utah, Wyoming, excepting Laramie County, Idaho, Montana.

(3) Zone "C" means:

The territory west of zone "B."

Graphite

Dec. 27, 1941. Graphite one of thirteen materials put under Government control by General Imports Order M-63. All contracts for imports will be handled by RFC. No private arrangements for imports may be made. Existing channels of dealers and brokers will be used by RFC. Collectors of customs will assist OPM in clearing shipments.

Insecticides

Dec. 12, 1941. Preference Order P-87 issued to help makers of insecticides, germicides and fungicides obtain materials. A-10 rating may be assigned. Form PD-82 must be filed.

Iridium

Jan. 15, 1941. Henderson issues warning on price increases.

Dec. 12, 1941. Conservation Order M-49 bans use of iridium and its alloys in jewelry. Refiners and dealers are required to report stocks as of Jan. 1, 1942.

Lead

Sept. 27, 1940. Price warning issued.

April 5, 1941. Henderson requests producers to refrain from selling above 5.85 cents.

May 1, 1941. Priorities Division establishes control over consumers' stocks under General Metals Order No. 1 to prevent excess inventory accumulation.

June 30, 1941. Commodity Exchange, Inc., forbids new futures commitments above 5.70 cents.

July 20, 1941. All lead held or to be purchased by Metals Reserve Co. to be allocated by OPM. Consumers urged to place orders with regular suppliers before making application to OPM for allocation of lead held by Metals Reserve Co.

Aug. 16, 1941. OPACS warns that scrap lead prices have increased too much.

Sept. 8, 1941. September allocations of foreign lead will be about 30,000 tons, compared with 28,000 in August and 27,000 in July, according to OPM.

Oct. 4, 1941. Lead put under full priority control by General Preference Order M-38. Both imported and domestic lead will be allocated by Priorities Division. Refiners and dealers required to file schedule of proposed shipments by 20th of preceding month. After Oct. 1 special pool to be created by OPM. Priorities Regulation No. 1 applies.

Oct. 22, 1941. November pool set at about 15 per cent of production. About 6,000 tons expected to be set aside for emergency purposes.

Nov. 5, 1941. OPA announced advance on lead ceiling is not contemplated.

Nov. 7, 1941. Mines asked to operate 24 hours a day, 6 days a week.

Nov. 29, 1941. Pool for December set at 15 per cent.

Dec. 20, 1941. Smelters and refiners given priority aid in securing maintenance and operating supplies. Preference Order P-73 assures complete cycle of domestic production from mining through refining.

Dec. 27, 1941. Imports of lead, one of thirteen materials, put under Government control by General Imports Order M-63. All contracts for imports will be handled by RFC. No private arrangements for imports may be made. Existing channels of brokers and dealers will be used by RFC. Collectors of customs will assist OPM in clearing shipments.

Dec. 31, 1941. January pool set by OPM at 15 per cent of November production.

Magnesium

Feb. 12, 1941. Producers requested by Priorities Division to allocate all stocks to defense industries.

Feb. 13, 1941. Manufacturers and fabricators directed to supply defense users for next ninety days, excluding all other demands, except articles in process.

March 3, 1941. Producers placed under mandatory priority status. A-2

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preference rating to be assigned all defense orders not having a higher rating. British orders to get same rating. Producers ordered to submit to Priorities Division lists showing orders, contracts and deliveries each month effective March 24, 1940.

March 26, 1940. Priority control changed to give all defense and British orders A-10 rating, higher ratings to be assigned by Army and Navy Munitions Board.

Nov. 14, 1941. General Preference Order M-2-b directs that all magnesium and magnesium products, in whatever form and by whomever held, not now being used to fill defense orders with ratings of A-1-j or higher, be reported to OPM before Nov. 30, 1941, and be held for sale to a producer or an approved smelter so that the metal will become available for defense uses.

Manganese

May 1, 1941. General Metals Order No. 1 of the Priorities Division establishes control over consumers' stocks to prevent excess inventories.

Sept. 23, 1941. General Metals Order No. 1 revoked. Inventory control continues under Priority Regulation No. 1.

Dec. 19, 1941. Manganese one of eight metals used for alloying purposes brought under control by M-21-a to supplement regulations in effect on Far Eastern commodities. Alloy steel containing same may not be sold after Jan. 1, except to fill defense orders.

Menthol

Aug. 22, 1941. Menthol producers and representatives of OPA discuss ways of maintaining adequate supplies.

Mercury

March 28, 1941. Price Administrator Henderson warns that prices are too high. Claims price structure artificial and must be lowered.

May 1, 1941. General Metals Order No. 1 establishes control over consumers' stocks to prevent excess inventories.

Aug. 15, 1941. OPA claims price of $192 per flask is too high. Asks buyers to report abnormal asking prices.

Dec. 20, 1941. Smelters and refiners given priority aid in acquiring maintenance and operating supplies. Preference Order P-73 assures complete cycle of domestic metal production from mining through defining.

Dec. 27, 1941. Mercury one of thirteen materials put under Government control by General Imports Order M-63. All contracts for imports will be handled by RFC. No private arrangements may be made for imports. Existing channels of dealers and brokers will be used by RFC. Customs collectors will assist OPM in clearing shipment.

Methanol

Aug. 28, 1941. Full priority control established, effective Aug. 28 to Nov. 30. Defense orders given certain ratings and must be accepted and fulfilled in preference to other contracts.

Nov. 12, 1941. Amendment to General Preference Order M-31; B-4 rating assigned to deliveries of natural origin methyl alcohol to be used as a denaturant for ethyl alcohol.

B-4 rating assigned for deliveries of synthetic methanol for general chemical manufacture, including formaldehyde for non-defense uses specified in General Preference Order M-25.

Preference rating B-8 assigned for deliveries of methyl alcohol for use as an anti-freeze and as a general denaturant and solvent.

Deliveries of methyl alcohol which will increase inventory beyond a thirty-day supply at current rate of use is forbidden.

Dec. 19, 1941. Preference order amended to promote use as denaturant for ethyl alcohol, in formaldehyde production and for general chemical manufacture.

Neoprene

March 7, 1941. Formal priorities, effective March 28, placed on suppliers giving all defense and British orders A-2 rating.

April 1, 1941. General Preference Order M-4 provides for April allocation of 1,000,000 lbs. to 250 consumers. Producer required to keep inventory record.

June 9, 1941. All synthetic rubbers placed under full priorities. All deliveries to be directed by OPM beginning July 1. Producers must keep accurate inventory records.

Jan. 2, 1942. Synthetic Rubber Order M-13 amended. Additional types of synthetic rubber added.

Nickel

Feb. 20, 1941. Nickel steel producers agree with Priorities Division to give first call to defense industries.

March 7, 1941. Priority control established. Defense and British orders to receive A-2 rating.

Nickel Scrap

And Other Scrap Materials Containing Nickel

Maximum Price Schedule No. 8, Effective June 1, 1941

Grade—	Price f. o. b. Point of Shipment
Pure scrap nickel	26c per pound of material
Ferro-nickel-chrome-iron scrap	26½c per pound of nickel content; 8c per pound of chrome content; no payment for other metals
Ferro-nickel-iron scrap	26½c per pound of nickel content; no other payment allowed
Monel metal scrap—	
New clippings	20c per pound of material
Soldered sheet	18c per pound of material
No. 1 castings and turnings	15c per pound of material
Cupro-nickel alloy scrap	26c per pound of nickel content; 8c per pound for copper if nickel and copper content combined is at least 90 per cent
Stainless steel scrap—	
Containing 16 to 20 per cent chrome, 7 to 10 per cent nickel	
Sheets, clippings and solids	$90 per gross ton
Turnings and borings	$60 per gross ton
All other grades	29c per pound of nickel content; 9½c per pound of chrome; no payment for other metals
Straight chrome type— Containing 16 to 18 per cent chrome	$40 per gross ton
Straight chrome type— Containing 12 to 14 per cent chrome	$35 per gross ton
Nickel steel scrap—	
Less than 1 per cent nickel	Determined by like grades of steel scrap in Schedule No. 4
More than 1 per cent nickel	As above, plus $1 per gross ton for each ¼ per cent of nickel content
Monel ingot and shot	27c.
Copper-nickel-shot— Containing 48 to 52 per cent of each and not more than ½ per cent of foreign materials	25½c

Note: These prices apply to sale of unprepared material in lots of 30,000 pounds or more, exceptions being allowed to converters, and premiums being granted for less than quantity shipments.

CONVERTERS' PREMIUMS

Pure nickel scrap	2 cents per pound
Ferro-nickel-chrome-iron scrap	1½ cents per pound
Monel metal scrap	2 cents per pound
Cupro-nickel alloy scrap	2 cents per pound

PREMIUMS FOR SALES IN LESS THAN 30,000-POUND LOTS

Varying premiums are allowed under the various grades and kinds of nickel and scrap.

COMMISSIONS

Agents or brokers may charge 5 per cent of the maximum for stainless steel scrap, and 2 per cent for nickel steel scrap.

April 11, 1941. Priorities system, effective April 30, established for producers of nickel-bearing steel and distributors of such steel from warehouses.
Defense orders and British defense orders given rating of A-10 unless higher rating is specifically assigned.
Over-all formula for industry issued. Includes specific schedule of preference ratings.

April 30, 1941. General Preference Order M-5 amended to direct distribution of nickel-bearing steel extends regulations to converters.
Purchasers ordered to file complete statements on inventory holdings as of April 30 with the Priorities Division.
Nickel steel defined as any steel containing 0.40 per cent. or more of nickel, or any steel less than 0.40 per cent of nickel if nickel is specified by the customer or is known to have been added to obtain a desired physical quality in the steel.

May 19, 1941. Allocations order directs all nickel supply into defense channels. Non-defense users completely eliminated. Defense orders taken A-10 rating. Priorities Division will make month by month allocations. Producers and distributors required to keep records of orders and inventories and furnish data to Priorities Division each month.

June 2, 1941. Price Schedule No. 8 issued by OPACS fixes ceiling prices for nickel scrap.

June 17, 1941. Priority Division orders that nickel-bearing stainless steel products may not contain more than 40 per cent primary nickel, balance to come from scrap.

June 26, 1941. Price Schedule No. 8 amended.

July 25, 1941. Expansion of production arranged by Material Co-ordinating Committee for United States and Canada. U. S. imports to be increased 20 per cent.

Sept. 8, 1941. Price Schedule No. 8 amended. Prohibits manufacturers from obtaining converter premiums, revises schedule on stainless steel scrap and raises brokerage commissions.

Sept. 30, 1941. Priority Control M-6-a extended to March 31, 1942.

Dec. 19, 1941. Nickel, one of eight metals used for alloying purposes, brought under control by M-21-a to supplement regulations in effect on Far Eastern commodities. Alloy steel containing same may not be sold after Jan. 1, except to fill defense orders.

Paraformaldehyde
(See Formaldehyde)

Phenols

Aug. 30, 1941. General Preference Order M-27 establishes full priority control effective Aug. 30 to Dec. 31. Defense orders assigned A-10 rating and must be accepted in accordance with General Regulation No. 1. Materials affected are synthetic phenols from whatever source derived; the acids, either in pure or crude form, recovered from coal tar distillates, comprising chiefly phenol, ortho cresol, meta cresol, paracresol and xylenols and various mixtures of these products.

Nov. 10, 1941. General Preference Order M-27 amended. Priorities Regulation No. 1 made applicable. Specific directions as to shipments will be given each month by Priorities Director. Special inventory report required of all except producers who have more than 30 days supply on hand.

Phosphates
(Triphenyl and Tricresyl)

Aug. 30, 1941. General Preference Order M-16 establishes full priority control effective Aug. 30 to Dec. 31, 1941. Defense orders given A-10 rating and must be accepted in accordance with General Regulation No. 1. Allocation of residual supply may be regulated.

Phosphorus Oxychloride

Aug. 28, 1941. General Preference Order M-35 establishes full priority control effective Aug. 30 to Dec. 31. Defense orders given A-10 rating and must be accepted and fulfilled in accordance with Priority Regulation No. 1.

Polyvinyl Chloride

Aug. 9, 1941. General Preference Order M-10 establishes full priority control. Order affects all producers of polyvinyl chloride which is defined as polymerized vinyl chloride and its copolymer with vinyl acetate, containing 92 per cent or more of vinyl chloride, including Koroseal and Vinylite.
Order directs that no producer shall make deliveries of polyvinyl chloride after June 1, 1941, except as specifically directed by Priorities Director. No producer who manufactures polyvinyl chloride shall, after June 16, 1941, further process or use the same except as directed by Priorities Director. All producers and customers are required to keep accurate records.

Potassium Perchlorate

Aug. 28, 1941. General Preference Order M-32, effective Aug. 28 to Nov. 30, establishes full priority control. Ratings established for defense orders which must be accepted and fulfilled in preference to all other contracts.

Potassium Permanganate

Aug. 28, 1941. General Preference Order M-33, effective Aug. 28 to Nov. 30, establishes full priority control. Ratings established for defense orders which must be accepted and fulfilled in preference to all other contracts.

Refrigerant Gases

Aug. 15, 1941. Available supplies of Freon allocated to users and manufacturers of civilian refrigeration and air-conditioning equipment.

Aug. 22, 1941. Full priority control established on chlorinated hydrocarbon refrigerants by General Preference Order M-28. A-10 rating given defense orders. Residual supply will be allocated.

Rubber

June 17, 1941. Rubber conservation plan announced to cut consumption to 600,000 tons annually. Will involve allocation, priorities and control of imports and will be administered by OPM, OPACS and Rubber Reserve Co. General Preference Order M-15 provides that defense business be filled first after which non-defense deliveries may be made. OPM will allocate all rubber released by the Rubber Reserve Co.

June 22, 1941. OPA announces ceiling will be imposed on tires, tubes, crude, reclaimed and scrap rubber at levels prevailing June 16. Civilian allocation and priority programs issued to reduce annual consumption to 600,000 tons. Quotes limit monthly consumption of processors for second half of year to fixed percentages of average monthly consumption in the twelve months from April, 1940 to March, 1941 as follows: July, 99 per cent.; Aug., 94 per cent.; Sept., 89 per cent.; Oct., 84 per cent.; Nov., 82 per cent.; Dec., 80 per cent.

June 27, 1941. Rubber priority order amended to provide that no processor be required to reduce July consumption by more than 20 per cent of consumption for June, even though amount processor consumes or processes exceeds specified July quota.

July 28, 1941. Priority Order relaxed to ease burden on small processors, 2474 of whom each consuming less than 10 tons a month will not have to cut operations in August. 86 other firms working on defense orders given special adjustments. 144 larger processors must fill terms of original order.

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Aug. 1, 1941. Priority order amended to provide that special adjustments may be made for users of small amounts.

Aug. 7, 1941. Rubber Reserve Co. announces that crude rubber will be made available to manufacturers at $22\frac{1}{2}$ cents per lb. for No. 1 smoked ribbed sheets at dock or warehouse, New York City. Other types and grades will have appropriate differentials.

Dec. 11, 1941. Dealers who sell scrap to reclaiming plants have been asked to refrain from raising prices above those charged on Dec. 5, if no sales made Dec. 5 to be guided by most recent sale prior to that date.

Order M-15-b provides that no processor shall consume, use or process any rubber except for following purposes:

Crude Rubber

Rubber Reserve Co.'s Selling Prices

(Ex-dock, ex-warehouse or f. o. b. cars New York City, Boston, Baltimore, New Orleans, Los Angeles and San Francisco, at the option of the Rubber Reserve Co.)

Grade	Price
No. 1X ribbed smoked sheets, in bales	$22\frac{1}{2}$c
No. 1X ribbed smoked sheets, in cases	$22\frac{1}{2}$c
No. 1 ribbed smoked sheets, in cases	$22\frac{7}{16}$c
No. 1 ribbed smoked sheets, in bales	$22\frac{7}{16}$c
No. 2 ribbed smoked sheets, in bales	$22\frac{1}{4}$c
No. 3 ribbed smoked sheets, in balse	22c
No. 4 ribbed smoked sheets, in bales	$21\frac{3}{4}$c
No. 5 ribbed smoked sheets, in bales	$20\frac{5}{8}$c
No. 1X thick pale latex crepe, in cases	$23\frac{5}{16}$c
No. 1X thick pale latex crepe, in bales	23c
No. 1 thick pale latex crepe, in cases	$23\frac{3}{16}$c
No. 1 thick pale latex crepe, in bales	$22\frac{7}{8}$c
No. 2 thick pale latex crepe, in cases	$22\frac{1}{8}$c
No. 2 thick pale latex crepe, in bales	$22\frac{1}{8}$c
No. 3 F. A. Q. thick palish latex crepe, in cases or bales	$21\frac{7}{8}$c
No. 1X thin pale latex crepe in cases N	$23\frac{5}{16}$c
No. 1 thin pale latex crep, in cases	$23\frac{3}{16}$c
No. 2 thin pale latex crepe, in cases	$22\frac{1}{8}$c
No. 2 thin pale latex crepe, in bales	$22\frac{1}{8}$c
No. 3 F. A. Q. thin palish latex crepe in cases or bales	$21\frac{7}{8}$c
No. 1X thick brown crepe, in bales	$21\frac{3}{8}$c
No. 2X thick brown crepe, in bales	$21\frac{1}{16}$c
No. 3X thick brown crepe, in bales	20c
No. 1X thin brown crepe, in cases	$21\frac{3}{8}$c
No. 1X thin brown crepe, in bales	$21\frac{3}{8}$c
No. 2X thin brown crepe, in cases	$21\frac{1}{16}$c
No. 2X thin brown crepe, in bales	$21\frac{1}{16}$c
No. 3X thin brown crepe, in cases	20c
No. 3X thin brown crepe, in bales	20c
No. 1 thick remilled blanket crepe, in bales	$21\frac{3}{8}$c
No. 2 thick remilled blanket crepe, in bales	$21\frac{1}{4}$c
No. 3 thick remilled blanket crepe in bales	$21\frac{1}{8}$c
No. 4 thick remilled blanket crepe, in bales	$20\frac{5}{8}$c
No. 1 thin brown remilled crepe, in bales	$21\frac{1}{4}$c
No. 2 thin brown remilled crepe, in bales	$21\frac{1}{16}$c
No. 3 thin brown remilled crepe, in bales	$20\frac{5}{8}$c
No. 4 thin brown remilled crepe, in bales	20c
No. 1 rolled brown, in bales	$17\frac{5}{16}$c
No. 1 smoked blanket	$21\frac{1}{8}$c
No. 2 smoked blanket	21c
Claro brand No. IX RSS, in cases	$22\frac{5}{8}$c
No. 1X RSS European estates trimmings, in cases or bales	22c
Sole crepe trimmings and/or No. 1X thin pale crepe trimmings, in cases or bales	$22\frac{7}{8}$c
R. C. M. A. watermarked crepe, Type No. 16, in cases	$26\frac{3}{8}$c
R. C. M. A. watermarked crepe, Type No. 17, in cases	$25\frac{7}{8}$c
R. C. M. A. watermarked crepe, Type No. 18, in cases	$24\frac{3}{8}$c
Sole crepe (Harrison and Crossfield and R. C. M. A.), in cases	*$28\frac{1}{8}$c

* Plus import duty.

Aug. 12, 1941. OPA asks liquidation of open rubber positions on Commodity Exchange.

Sept. 7, 1941. Industry advisory committees, propose more flexible plan for disposition of rubber among firms having more than one plant. Involves plant allocation of rubber.

Sept. 10, 1941. Resumption of futures trading on Commodities Exchange, Inc., for liquidation purposes at a maximum trading price of $22\frac{1}{2}$ cents per lb. approved by OPA.

Oct. 5, 1941. Warning issued concerning rubber scrap prices.

Nov. 11, 1941. Rubber processors operating plants in more than one community ordered to report on distribution among individual plants during July, including rubber released by the Rubber Reserve Co.

Dec. 5, 1941. OPA asks rubber footwear manufacturers to refrain from further price advances. Manufacturers asked to give advance notice of any contemplated changes in their products.

(1) To fill order assigned an A-3 or better preference rating.

(2) To manufacture camelback in amounts not exceeding the minimum amounts specified in letter dated December 5, 1941, from the Director of Priorities to manufacturers of camel back.

(3) To manufacture tire casings and tubes and other rubber products necessary for the manufacture, maintenance or repair of trucks or buses which require tires having a diameter of 7 inches or more.

(4) To manufacture mechanical goods, hard rubber products, and sponge rubber products for industrial equipment, maintenance and repair.

(5) To manufacture medical, surgical and druggists' supplies.

(6) To manufacture cements for the shoe trade, and heels made of black or brown composition rubber only, and soles, taps and soling strips made of black composition rubber only.

(7) To fill orders for industrial rubber gloves, fabric-topped footwear made with black compounded rubber soles only, rubber boots, and protective rubber clothing, galoshes with fabric tops, and plain all rubber overshoes and galoshes.

(8) To manufacture plumbers' supplies.

(9) To manufacture articles for use in the canning and food packing industries.

(10) To manufacture compounds for insulating wire and cable.

Dec. 16, 1941. Two principal American sellers of guayule rubber have been asked by OPA to refrain from increasing prices above those prevailing on Dec. 6.

Dec. 17, 1941. Ceiling prices set for reclaimed rubber at levels prevailing between Nov. 5 and Dec. 5, effective Dec. 20.

Reclaimed Rubber

Price Schedule No. 56

Effective Decembr 20 1941

§ 1315.51. Maximum prices for Reclaimed Rubber.

(a) On and after December 20, 1941, regardless of the terms of any contract of sale or purchase, or other commitment, no person shall sell, offer to sell, deliver or transfer, reclaimed rubber, and no person shall buy, offer to buy, or accept delivery of reclaimed rubber, at prices higher than the maximum price.

(b) 1. The maximum price shall be the highest price received by the seller for a sale during the period between November 5, 1941 and December 5, 1941, of reclaimed rubber of the same grade and quality, and of a comparable amount to the same purchaser.

2. If no such sale to the same purchaser was made, the maximum price shall be the highest price received by the seller for a sale during such period, of reclaimed rubber of the same grade and quality, and of a comparable amount to a purchaser previously accorded similar treatment by the particular seller or recognized by the trade as entitled to similar treatment.

3. If, for any grade and quality of reclaimed rubber, no sale was made during the period between November 5, 1941, and December 5, 1941, either to the same purchaser or to a purchaser so entitled to similar treatment, the maximum price for that grade and quality shall be a price which bears the same relationship to prices actually received by the seller during such period for other grades and qualities, as the price of that particular grade and quality normally bears to prices of such other grades and qualities.

Dec. 20, 1941. Restriction on rubber processing not to apply to rubber in process of manufacture Dec. 11. OPM lists thirteen categories for which processing is limited. Amendment 1 to Supplementary Order M-15-b extends ban on sales of new tires until Jan. 15, 1942.

Dec. 26, 1941. Amendment No. 2 to Supplementary Order M-15-b permits rubber processing for manufacture of fire hose and other fire extinguishing apparatus. Production of such equipment restricted to November rate.

Shellac

Dec. 10, 1941. OPM order received by importers asks that they not ship any

natural resins to anyone except on sworn statements that immediate shipments are essential for direct defense requirements or that such shipments are essential to prevent immediate shutdown of plant.

Dec. 13, 1941. Importers requested not to raise price above those prevailing Dec. 5.

Solvents

Aug. 30, 1941. Dealers, purchasers and producers asked not to raise prices above July 29 level.

Sperm Oil

Oct. 18, 1941. General Preference Order M-40 establishes priority control over crude and refined sperm oil. Prevents deliveries except for defense purposes. Provides that any dealer holding in excess of 100,000 lbs. shall set aside 30 per cent of all stocks in a special pool from which allocations may be made by Director of Priorities. Such dealers are required to set aside 30 per cent of shipments received, for same purpose.

Sulfuric Acid

Dec. 17, 1941. Large producer agrees with OPA to hold prices at current level for first quarter of 1942.

Synthetic Fibers

Nov. 14, 1941. OPA announces study of nylon prices to find out if price ceiling is required.

Synthetic Resins

July 31, 1941. OPA cuts civilian use of synthetic resins and plastics made from formaldehyde, paraformaldehyde, and hexamethylenetetramine. Uses of resins in certain non-essential items banned.

Aug. 21, 1941. Formaldehyde, paraformaldehyde and hexamethylenetetramine placed under full priority control. A-10 rating assigned for defense orders which must be accepted in preference to other business. Synthetic resins made from these materials also covered.

Synthetic Rubber

June 9, 1941. All synthetic rubbers placed under full priorities by General Preference Order M-13. Priorities Division to direct all deliveries beginning July 1. Producers must keep accurate records.

Jan. 2, 1942. General Preference Order M-13 amended to include additional types of synthetic rubber.

Tin

May 5, 1941. OPM requests can manufacturers to make 10 per cent reduction in tin coating of most cans.

July 28, 1941. OPM requests tin consumers to stop buying until increase in their own inventories during period July 1940 to date is cut in half.

Aug. 14, 1941. Price ceiling No. 17, effective Aug. 16, sets price of 52 cents per lb., for grade A pig iron. Future trading to be limited to liquidation of open contracts. Differentials established for various grades. Exceptions under certain conditions provided for commitments entered into prior to that date.

Tin

Maximum Price Schedule No. 17

Effective August 16, 1941

Ex Dock or Store, Port of New York

(Per Pound)

Grade	Maximum price
A—99.80% or higher percentage of purity, meeting specifications set forth in "Specifications and Proposals for Supplies, No. S-14," issued December 15, 1939, by the U. S. Treasury Department, Procurement Division, except that pig tin of this grade need not be free of scrap and remelted metal	$0.52
B—99.75% to 99.79% pure, inclusive	.51625
C—Cornish refined	.51625
D—99.00% to 99.74% pure, inclusive	.51125
E—Below 99% pure (for tin content)	.51

DIFFERENTIALS FOR SMALL LOTS

For sales of pig tin in lots of	There may be added to the maximum price
2,240 to 11,199 lbs., inclusive	1c per lb.
1,000 to 2,239 lbs., inclusive	1½c per lb.
500 to 999 lbs., inclusive	2½c per lb.
Under 500 lbs.	3c per lb.

DIFFERENTIALS FOR FREIGHT RATES

The above maximum prices are, in the case of foreign pig tin, ex dock or store, Port of New York, and, in the case of domestic pig tin, ex producer's plant. The maximum prices of foreign pig tin which is imported through ports of entry other than the Port of New York shall be ex dock or store at the actual port of entry and shall be as much more or as much less than the above prices as the ocean freight from the point of shipment to the actual port of entry exceeds or is less than the ocean freight from such point of shipment to the Port of New York. Foreign pig tin which is physically present at or is sold for shipment from a point other than the port at which it was entered, and domestic pig tin which is physically present at or is sold for shipment from a point other than the producer's plant, may be sold at prices, f. o. b. such point of physical presence or of shipment, which exceed the above maximum prices by no more than the domestic shipping charges which have actually been paid or must be paid in order to transport such pig tin to such point of physical presence or of shipment.

Aug. 22, 1941. Metal Reserve Corp. offers moderate amount of tin for domestic consumption at prices of 52 cents on spot delivery.

Sept. 19, 1941. Amended to Price Schedule No. 17 classifies as Grade B pig tin which assays 99.80 per cent pure but which contains impurities exceeding tolerances for Grade A. Grade B sells at discount of three-eighths of a cent under 52c maximum allowed for Grade A.

Tin

Price Schedule No. 17

Effective August 16, 1941

As Amended September 19, 1941

Ex Dock or Store, Port of New York

(Per Pound)

Grade	Maximum price
A—99.80% or higher percentage of purity, meeting specifications set forth in "Specifications and Proposals for Supplies, No. S-14," issued December 15, 1939, by the U. S. Treasury Department. Procurement Division, except that pig tin of this grade need not be free of scrap and remelted metal	$0.52
B—99.75% to 99.79% pure, inclusive; and 99.80% or higher percentage of purity which does not otherwise meet the specifications of grade A	.51625
C—Cornish refined	.51625
D—99.00% to 99.74% pure, inclusive	.51125
E—Below 99% pure (for tin content)	.51

DIFFERENTIALS FOR SMALL LOTS

For sales of pig tin in lots of	There may be added to the maximum price
2,240 to 11,199 lbs., inclusive	1c per lb.
1,000 to 2,239 lbs., inclusive	1½c per lb.
500 to 999 lbs., inclusive	2½c per lb.
Under 500 lbs.	3c per lb.

DIFFERENTIALS FOR FREIGHT RATES

The above maximum prices are, in the case of foreign pig tin, ex dock or store, Port of New York, and, in the case of domestic pig tin, ex-producer's plant. The maximum prices of foreign pig tin which is imported through ports of entry other than the Port of New York shall be ex dock or store at the actual port of entry and shall be as much more or as much less than the above prices as the ocean freight from the point of shipment to the actual port of entry exceeds or is less than the ocean freight from such point of shipment to the Port of New York. Foreign pig tin which is physically present at or is sold for shipment from a point other than the port at which it was entered, and domestic pig tin which is physically present at or is sold for shipment from a point other than the producer's plant, may be sold at prices, f. o. b. such point of physical presence or of shipment, which exceed the above maximum prices by no more than the domestic shipping charges which have actually been paid or must be paid in order to transport such pig tin to such point of physical presence or of shipment.

Dec. 17, 1941. Order M-43 places tin completely under Government control. Priorities Division will allocate all supplies and specify uses. No tin may be sold or delivered without permission. Future imports may be sold only to Metals Reserve Corp. Tin now afloat may not be sold except by special permission.

Dec. 31, 1941. Tin used in twenty-nine items between Jan. 1 and March 31 ordered limited to 50 per cent of amount used in same period of 1940. Use of tin to be totally discontinued after March 31. Cans and containers not affected.

Titanium Pigments

Nov. 23, 1941. General Preference Order M-44, effective Dec. 1, places total

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titanium pigment supply under direct allocation by OPM. Order provides for setting up defense pool to care for all mandatory orders for titanium dioxide used as pigment. Remainder to be procated equitably among all customers.

Jan. 2, 1942. Prominent producer agrees to withdraw proposed price increase of 1 cent per lb.

Toluene

Aug. 28, 1941. General Preference Order M-34, effective Aug. 28 to Nov. 30 establishes full priority control. Ratings issued for defense orders which must be given preference over all other contracts.

Dec. 16, 1941. Toluol, benzol, xylol, solvent naphtha obtained from by-product coke ovens, will have prices stabilized at levels not more than 1 cent per gallon higher than fourth quarter, 1941 levels during first quarter of 1942.

Dec. 29, 1941. General Preference Order M-34 amended. Toluene to be completely allocated after Feb. 1. Deliveries banned without authorization. Producers required to file monthly schedule of production and deliveries of commercial grades by fifteenth of preceding month. After Feb. 1 at least 70 per cent of total production must be of nitration grades.

Vanadium

Aug. 14, 1941. General Preference Order M-23 establishes full priority control. Defense orders given A-10 rating and must be accepted in preference to non-defense business. After Sept. 1, manufacturers wishing to purchase metal must file statement on intended use not later than 25th of preceding month. Deliveries restricted to amount necessary to fill orders at current rate of production. Formula set up for acceptance of defense orders. Vanadium removed from General Metals Order No. 1.

Dec. 19, 1941. Vanadium one of eight metals used by alloying purposes brought under control by M-21-a to supplement regulations in effect on Far East commodities. Alloy steel containing same may not be sold after Jan. 1, except to fill defense orders.

Dec. 20, 1941. General Preference Order M-23-a replaces M-23 and puts vanadium under complete allocation control. Provides for monthly requests for vanadium allotments. Allocations will be made without regard to previous preference ratings.

Dec. 27, 1941. General Imports Order M-63 puts imports of thirteen materials under Government control. All contracts for imports will be handled by R. F. C. No private arrangements for imports may be made. Existing channels of brokers and dealers will be used by R. F. C. Collectors of customs will assist OPM in clearing of shipments.

Wax

Dec. 26, 1941. Wax manufacturers asked to keep prices down. OPA requests that prices of carnauba, beeswax, candelilla, and ouricury not be raised above f.o.b. New York prices prevailing Dec. 18.

Wood Alcohol

Oct. 4, 1941. Price Schedule No. 34, effective Oct. 10, 1941 establishes ceilings for denaturing, pure, 95 per cent and 97 per cent wood alcohol, covering all transactions in containers of 50 gallons or more.

Wood Alcohol

Price Schedule No. 34

Effective October 10, 1941

The following maximum prices are established for wood alcohol:

I. Tank Cars
East of the Mississippi River

	Per gallon delivered
Denaturing grade	60c
Pure methyl alcohol	60c
*95 per cent methyl alcohol	60c
*97 per cent methyl alcohol	60c

* Specifically designated.

West of the Mississippi River

Maximum prices for tank car quantities in territory west of the Mississippi River are determined by adding 3c per gallon to the maximum prices established above for tank cars in territory east of the Mississippi River.

II. Drums and other Containers, Carload Quantities

Maximum prices for drums and other containers, in carload quantities, in territory east or west of the Mississippi River are determined by adding 6c per gallon to the maximum prices established for tank cars in the respective territory by Paragraph 1 of this Appendix.

III. Drums and Other Containers, Less Than Carload Quantities

Maximum prices for drums and other containers, in less than carload quantities, in territory east or west of the Mississippi River, are determined by adding 16c per gallon to the maximum price established for tank cars in the respective territory by paragraph 1 of this Appendix.

Zinc

March 7, 1941. Zinc producers instructed by Priorities Division to set aside reserve pool of 5 per cent of April production for allocation to ease shortages.

March 31, 1941. Price Schedule No. 3 issued for zinc scrap and secondary slab. Complete records of sales and purchasers are required.

June 11, 1941. Full priority control put on Zinc, effective July 1 (General Preference Order M-11). Defense needs to be filled ahead of all others. Emergency pool to be created. Residual supply will be allocated among competing civilian demands by OPM in cooperation with OPACS. Inventories limited to prevent excess accumulation. Zinc dust and zinc oxide included.

June 28, 1941. Priority order amended to provide that a producer, although required to set aside certain amounts for pool, will be permitted to make full deliveries of minimum quantities as long as they do not conflict with defense orders. Customers for zinc must file affidavits with suppliers stating that they are not building up inventories unnecessarily. Producers required to file affidavits with OPM promising to report infractions on the part of customers.

Sept. 22, 1941. Zinc priorities order interpreted to permit producers to continue pro-rata shipments after pool requirements are satisfied by making priorities regulation No. 1 inapplicable in this connection.

Oct. 16, 1941. Amendment to General Preference Order M-11 exempts producers of zinc, zinc oxide and zinc dust from secondary materials, under toll agreements, from setting aside material for pool.

Oct. 17, 1941. Price Schedule No. 3 amended.

Zinc Scrap

Maximum Price Schedule No. 3

Effective March 31, 1941

ZINC SCRAP SCHEDULE

Grade of Zinc Scrap Materials—	Maximum Price (Per lb.)
New zinc clippings, trimmings	*6.75c
Engravers' and lithographers' plates	*6.75
Old zinc scrap	*5.10
Unsweated zinc dross	†5.10
Die cast slab	†4.95
New die cast scrap	†4.60
Radiator grilles, old and new	†4.60
Old die cast scrap	†4.25

* Delivered buyer's plant.
† F. o. b. point of shipment.

The maximum prices herein established are the maximum prices to be paid for the zinc scrap materials herein enumerated after the free iron and other foreign materials are removed.

SECONDARY SLAB ZINC

Grade—	Maximum Prices—Lots *Carload	†Less than Carload
Prime Western or poorer grade	7.25	8c
Brass special	7.35	8.10
Intermediate	7.50	8.25

* Per pound, delivered buyers' customary rail receiving point. Added to price carload freight from East St. Louis to buyers' customary rail receiving point.
† Per pound: f. o. b. seller's plant or warehouse. Added to price carload freight from East St. Louis to seller's plant or warehouse.

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Zinc Scrap
Price Schedule No. 3

Effective March 31, 1941
Amended October 17, 1941

GRADE OF ZINC SCRAP MATERIAL
(Per Pound, F. O. B. Point of Shipment)

	Maximum Price
New Zinc clippings, trimmings	7.25c
Engravers' and lithographers' plates	7.25c
Old zinc scrap	5.75c
Unsweated zinc dross	5.80c
Die cast slab	5.80c
New die cast scrap	4.95c
Radiator grilles, old and new	4.95c
Old die cast scrap	4.50c

The maximum prices herein established are the maximum prices to be paid for the zinc scrap materials herein enumerated after the free iron and other foreign materials are removed.

QUANTITY PREMIUMS

To the maximum prices set forth above, a premium of one-half (½c) cent per pound may be added.

(1) On single shipments of 10,000 pounds or more of any one of the following grades or of combinations thereof:
New zinc clippings and trimmings
Engravers' and lithographers' plates
Old zinc scrap; and

(2) On single shipments of 20,000 pounds or more of any one of the following grades, or of combinations thereof:
New die cast scrap
Radiator grilles, old and new
Old die cast scrap.

For the purpose of this schedule the term "single shipment" means all deliveries made to a buyer within a period of 48 consecutive hours, excluding Sundays and legal holidays.

TERMS OF SALE

The maximum prices set forth above are f. o. b. point of shipment. Zinc scrap may, however, be sold, offered for sale, delivered or transferred at a price delivered buyer's customary receiving point. In such cases, whenever the total delivered price exceeds the maximum f. o. b. point of shipment price fixed by this schedule, in all price quotations (a) the transportation charge must be shown as a separate item, (b) the price f. o. b. point of shipment obtained by subtracting the transportation charge from the total delivered price must not exceed the maximum f. o. b. point of shipment price set forth in this schedule, and (c) when delivery is made in the seller's conveyance, the transportation charge shall not exceed the lowest available commercial transportation rate for effecting the delivery.

SECONDARY SLAB ZINC

Sold, or shipped, delivered, or carried away, in carload lots.
Cents per pound, delivered buyer's customary rail receiving point, plus carload freight from E. St. Louis to buyer's customary rail receiving point.

Grade	Maximum Price
Prime Western and poorer grades	8.25c
Brass special	8.35c
Intermediate and higher grades	8.50c

Sold and shipped, delivered, or carried away, in less than carload lots.
Cents per pound, f. o. b. seller's plant or warehouse, plus carload freight from E. St. Louis to seller's plant or warehouse.

Grade	Maximum Price
Prime Western and poorer grades	9.00c
Brass special	9.10c
Intermediate and higher grades	9.25c

The above grades of secondary slab zinc are to be determined in accordance with the specifications of the American Society for Testing Materials.

The minimum quantity making up a carload lot for the purposes of this schedule will be the minimum quantity required to obtain railroad carload lot rates from the point of shipment to the point of destination.

Oct. 23, 1941. Zinc dust producers allowed to raise price from 9.5 cents per lb., delivered in car-load lots, drums

Courtesy Stonehill's Book Shop.

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returned, to 10.35 cents per lb. Less than car-load shipments placed at 11.35 cents per lb. f.o.b. shipping point, drums not returned. Pacific Coast zinc dust set at 12¼ cents per lb. for high efficiency grade and 12 cents a lb. for regular grade.

Nov. 29, 1941. List of maximum prices for rolled zinc sheets, strip and plates issued by OPA in light of recent increase of 1 cent per lb. for slab. Prices allow differential of 4.9 above price of Prime Western zinc for sheet and 4 cents strip.

Dec. 15, 1941. Zinc oxide price list issued by OPA, effective Jan. 1, 1942, includes delivery in bags, car-load lots for lead-free American process oxide, 7.25 cents per lb., and loaded zinc oxide containing 35 per cent or more lead, 6.75 cents per lb.

Dec. 20, 1941. Smelters and refiners given priority aid in acquiring maintenance and operating supplies. Preference Order P-73 assures complete cycle of domestic production from mining through refining.

Dec. 27, 1941. General Imports Order M-63 puts imports of thirteen materials under Government control. All contracts for imports will be handled by RFC. No private arrangements for imports may be made. Existing channels of brokers and dealers will be used by RFC. Collectors of customs will assist OPM in clearing of shipments.

Dec. 31, 1941. Zinc pool for Jan. increased 2 per cent. Zinc oxide pool ordered resumed by OPM. Producers to set aside 31 per cent of October production of metallic zinc for allocation. Jan. zinc oxide pool to be 10 per cent of October production.

Rolled Zinc

O P. A. Maximum Prices as of November 29, 1941

A list of maximum prices for rolled zinc sheets, strip and plates, which the Office of Price Administration has prepared in the light of the recent 1c a pound increase in the price of slab zinc, has been made public by Leon Henderson, Administrator.
The approved maximum base prices are as follows:

Sheet zinc	13.15c per pound, f. o. b. mill
Carloads (36,000 lbs.) and over	7% discount
Ribbon or strip zinc	12.25c per pound, f. o. b. mill
3,000-lb. lots	1% discount
6,000-lb. lots	2% discount
9,000-lb. lots	3% discount
18,000 lb. lots	4% discount
Carload lots	7% discount
Zinc plates—	
Small (not over 12-in):	
Lots of 1,000 lbs. and over	11c per pound, f. o. b. mill
Lots of less than 1,000 lbs.	12c per pound, f. o. b. mill
Large (over 12-in.):	
Lots of 1,000 lbs. and over	12c per pound, f. o. b. mill
Lots of less than 1,000 lbs.	13c per pound, f. o. b. mill
Zinc engravers' plates—	
Raw	14.25c per pound, f. o. b. mill
Carloads (36,000 lbs.) and over—7% discount.	
Finished	21.25c per pound, delivered
Zinc lithographers' plates—	
Carloads (36,000 lbs.) and over—7% discount	15c per pound, f. o. b. mill

The new prices take into consideration the customary differentials between primary zinc and the various rolled zinc products, as well as the increased volume of production in the industry generally.